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THE

Dental Office and Laboratory.

THIRD SERIES.

VOL. I.

PHILADELPHIA, JANUARY, 1887.

No. 1.

WE MAKE OUR BOW IN OUR NEW DRESS.

We propose to change the "Dental Office and Laboratory" in form only for the present, and to abandon its form from the *old* size to its *new*. Many dentists have complained that its former shape was ill suited to the library or book shelves, while for ordinary perusal it was unhandy and cumbersome; hence many valuable contributions were lost and could not be kept for future reference. We trust its new form will overcome both of these drawbacks.

It will be the aim of its publishers to lay before its readers and patrons all that is going on in the world of dentistry, and in this they solicit the co-operation of all members of the dental profession.

They solicit original communications on all articles of practical interest, and for these they will pay at the rate of two dollars per printed page, if used.

This journal will be mailed to all subscribers at \$1 per annum, payable in advance.

The transactions of societies, reports, papers, letters from abroad relating to dentistry, translations, etc., are kindly solicited for publication.

The names of local societies, with the addresses of their officers, will be published gratis, and the same kept before the profession.

Wants and For Sales, if not exceeding thirty words, will be inserted free.

Cases of irregularity with the appliances used for their correction, as well as all instruments, conveniences, appliances, etc., etc., will be illustrated, for the better understanding of the subjects to which they relate.

"The Practical Place," so long and favorably received in our old issue, will be continued in this quarterly review.

We likewise propose to publish a series of practical articles on dental mechanism, as well as on all subjects of practical interest in

operative dentistry. These articles will contain all that is new in both these branches, but may be of more interest to the student than to the old practitioner; so that while we may be going over the beaten track, some lessons or hints, perhaps, may be learned or made available to all.

This quarterly will not confine itself *only* to articles pertaining to dentistry, but extracts of papers of interest from medical or scientific journals will find space in its columns.

VULCANITE WORK.

TAKING IMPRESSIONS OF THE MOUTH—BY DR THEO. F. CHUPEIN.

The patient being seated in the operating chair, the first effort will be the examination of the mouth; to ascertain where the hard and soft places are located. It will generally be found that along the ridge, from the heel of the jaw, or maxillary tuberosity, for about an inch to an inch and a half on each side, running forward will be hard. This hard surface will be generally about one-eighth to three-sixteenths of an inch in width. Along the median line there will likewise be found a hard surface extending backward from the rugae to the soft palate, more or less wide and varying in shape. These are generally the hard places. The soft places are found between the ridge and the median line, on each side, and the forward part of the ridge in the space generally occupied by the eight front teeth, viz., the four incisors, two cuspids, and two bicuspids. To make what we have described perfectly clear and comprehensible to the student, we have prepared a cut of a mouth having such hard and soft places which we have delineated. Fig. 1.

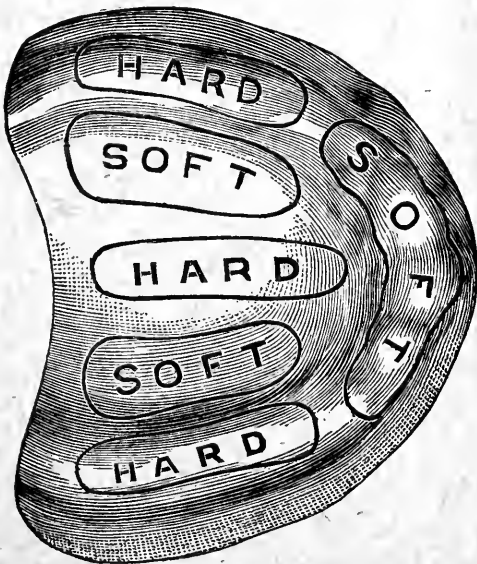


FIG. 1.

The mouth being examined, the next thing will be the selection of a proper sized and shaped impression cup. The impression cup should be somewhat larger than the gum it is to enclose. It should be about one-quarter inch wider and longer than the mouth; that is, one-eighth of an inch to spare on each buccal surface, one-eighth of an inch to spare in front or on the labial surface, and about one-eighth of an inch beyond the hard palate.

There are some operators

who give the preference to clean, fresh yellow beeswax to take impressions of the mouth; others to modelling composition. If the former be used it is softened in warm water of the temperature of 130° Fah. If modelling composition, nearly boiling water may be used to soften it. When either of these is softened, it is placed in the impression cup, which is warmed, to make it adhere to the cup. The cup is filled to the level of its rim. Too much impression material should not be used in the cup, as the excess is apt to curl or crowd over on to the soft palate, and produce nausea. Should the mouth have a deep or high arch, the impression material, when being put into the cup, may be pinched into an elevation, so as to be sure that this part of the mouth is well reached and impressed by the material.

The material being put into the cup, it is carried into the mouth. The operating chair should be a little lowered, so that the operator may stand behind and over the patient. The cup is introduced into the mouth holding it by the handle, when it is seized with the thumb and fingers of both hands, on each side, after it is introduced into the mouth, and brought into position, and the material pressed steadily up against the gum, the head of the patient resting against the chest of the operator; the back part of the cup near the boundary of the hard palate, being pressed against this part of the gum first. The cup may now be held firmly in position with the fingers of the left hand, *not permitting it to move from its place*, while with the forefinger of the right hand insinuated into the mouth under the lips, the material is pressed against the buccal and labial borders of the alveolar ridge covered by the gum. This being done the cup is held immovably in place until the material hardens, so that it may not be bent or twisted out of shape in taking it out of the mouth. The chilling or hardening of the impression material may be hastened by throwing a jet of cold, or iced water all over the impression cup while in the patient's mouth, by means of a dental syringe. It is thought that a good impression, of any material, will adhere to the gum when the mouth is edentulous, and will require some force to remove it. Should it adhere too tightly it may be loosened by holding back the lips to permit the air to pass between it and the gums, and throwing a jet of water between the lips and the impression, when it will either fall from its position or be easily removed. Should it not do so, a slight cough on the part of the patient, will usually effect its separation from the gum.

Of all the materials for taking impressions of the mouth, it is now almost universally conceded that plaster of Paris is the most reliable. To take an impression with this material, plaster of Paris is prepared and sold at the dental depots as "impression plaster." It differs only from model plaster, in being prepared to set rapidly, so that

the disagreeable operation of an impression with plaster is reduced to the shortest space of time possible. Many operators use model plaster, to which a little common table salt is added, for the purpose of inducing rapid setting. A cup for a plaster impression should have its posterior edge turned upward toward the soft palate, to prevent, as much as possible, the plaster from flowing over on to the tongue or fauces, and thus to rob the operation of some of its disagreements (see Fig. 3.) This part of the cup, however, may be improvised by sticking to it, at this part, a piece of base wax, and bending this upward, which serves admirably to retain the plaster, and to prevent the overflow. The cup being filled up to the rim with plaster, and made smooth with the spatula, it is introduced into the mouth quickly, one side at a time (pushing out the cheek on one side the better to introduce the entire cup, when the orifice of the mouth is small), and when in the mouth it is brought to the centre, the handle of the cup being held between the forefinger and thumb of the right hand, the other fingers resting against the palatine portion of the cup. It is then pressed upward, the back part of the plaster in the cup being brought in contact with this part of the gum first, and afterward on to the forward parts of the gums. Should the plaster incline to set quickly before the cup is brought into position, the fingers of the left hand may be quickly brought to the palatine surface of the cup to hold it steadily, while the forefinger of the right hand may be used to press or mat the plaster against the buccal and labial surfaces of the gums. The plaster in the impression cup is held steadily and immovably in position until it sets hard enough to break with a sharp, clean fracture. This is determined by what remains in the bowl, where it had been mixed with water. To be a good impression, it should adhere to the gum with some force. If it adhere too firmly it may be loosened by holding back the lips and throwing a jet of water from the dental syringe on to it next to the gums, or a slight cough on the part of the patient will generally loosen it. If the arch should be *moderately* high—too high for the impression cup to touch—it is a good plan, before introducing the impression cup filled with plaster as described, to daub all over the palatine surface of the gum some of the plaster from the bowl, with a spatula—and *then* introduce the cup. But if the arch is *very deep* or high, it is best first to take an impression with modelling composition, and when hard remove from the mouth and chill thoroughly. Then dress away all superfluous material, cutting away about one-eighth of an inch from the inner surface of this impression on all surfaces where it is thought the plate is likely to rest. A small quantity of plaster is now mixed and put into the space thus carved

out of this impression, when it is re-introduced into the mouth, and pressed into place as before described.

NAUSEA.

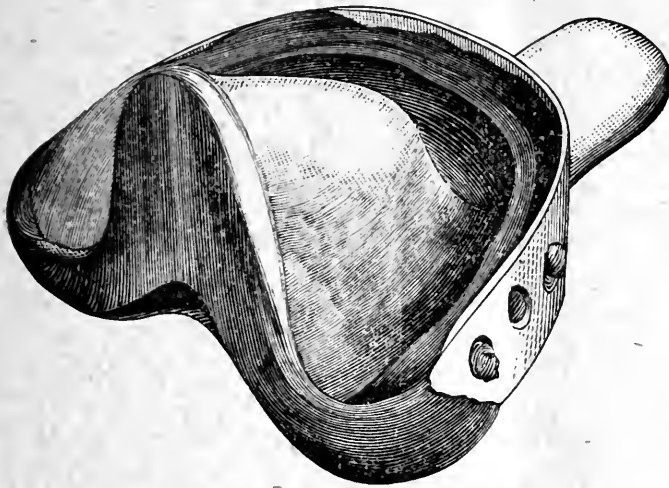


FIG. 2

Represents a modelling compound impression prepared as described.

pression can be taken.

It sometimes happens that persons are so sensitive about the mouth that they cannot bear any thing to touch the gums, and others that the slightest approach to, or encroachment on the soft palate, produces a nausea and retching that is painful in the extreme. Such mouths have to be educated, as it is said, until an im-

There is apparently something excessively nauseating to such persons when plaster of Paris is used for an impression material. Some of them seem to be able to put up (after education) with a wax or modelling compound impression, but plaster of Paris gags them beyond endurance. It is said that even for such as these, this idiosyncrasy may be entirely overcome, by painting the mucus membranes of the mouth, and particularly that about the posterior edge of the hard palate, and the anterior edge of the soft, with a 4 per cent. solution of hydra-chlorate of cocaine on a camel-hair pencil.

An impression cup such as is illustrated below (Fig. 3) would

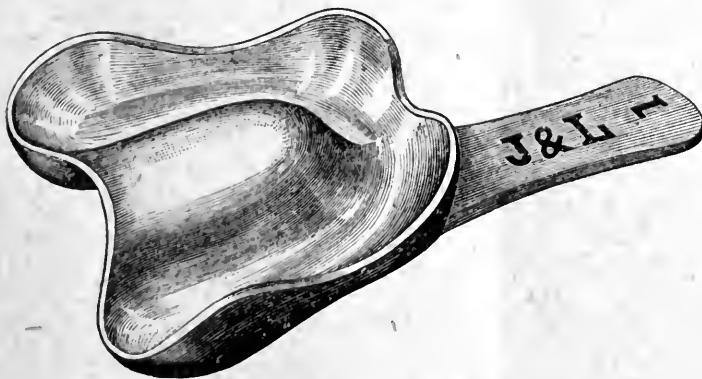


FIG. 3.

THE MODEL.

be of the proper form to take an impression of a mouth, such as is illustrated at Fig. 1.

For larger mouths layer cups will be necessary.

The impression of the mouth taken with plaster is represented at Fig. 4.

The impression being secured, the next step will be the construc-

tion of the model. For this purpose the plaster impression is painted

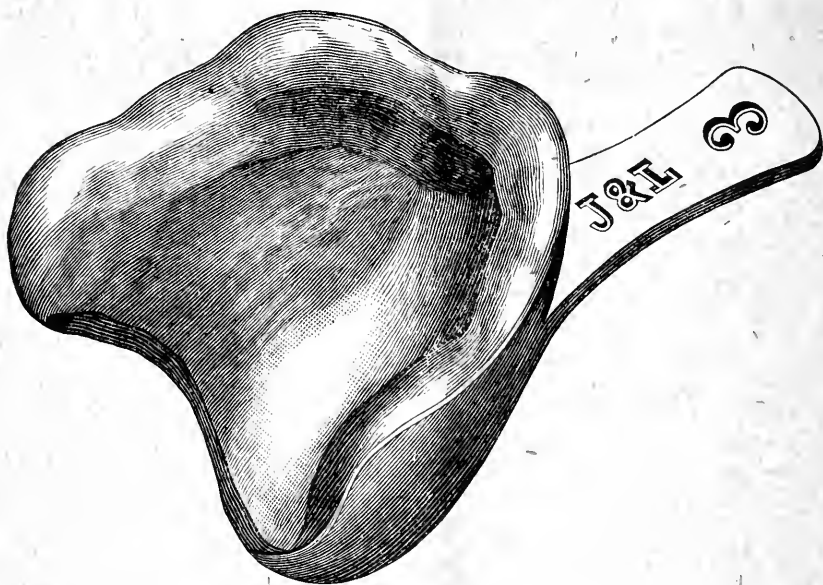


FIG. 4.

all over its surface with a thin coat of shellac varnish. When this has dried, another coat of thin sandarac varnish is applied to the same surface. This leaves the impression with a very smooth gloss, which is imparted to the model. Many operators object to the application of any varnish or oil to the impression, and fill the impression without any of these intermediary substances; but we have not found that the very thin film of these varnishes ever made any appreciable difference in the fit of a plate. Besides, with this preparation, the impression is parted from the model with much greater facility. There is no need to use oil or any parting compound on a plaster impression for the sake of parting it from the model; by simply placing it in a bowl of clean water and let it soak, while you mix your plaster in another bowl to make the model, there need be no fear of the two adhering.

To make a model from an impression taken and prepared as described, a sufficient quantity of water is put into a bowl and fine model plaster is sifted and put into it. It is a bad plan to take the quantity of plaster in the bowl first and add the water to it. Such a procedure is apt to result in a model filled with air holes. While the plaster is evenly mixed and freed from all air bubbles by putting it to the water, the impression is removed from the bowl of water into which it had been put, inverted, and shaken, so as to remove all the water that may have adhered to it. The bowl containing the plaster should be struck or rapped on a table on its bottom, to disengage any air that might still remain in the plaster. The impression may be held by the handle

of the cup, with the left hand, while the plaster is conveyed to it, with



FIG. 5.

a teaspoon or spatula (Fig. 5) in the right hand. The impression is filled by conveying the plaster first on one side, and tilting the cup so that the plaster will gradually and evenly flow all over the surface. This is made further necessary to prevent any air bubbles from being in the model, should the impression be filled from different points. When the whole surface of the impression is thus filled, it may be laid on a table on a piece of paper, and gradually built up to the desired height or thickness by the addition of plaster conveyed little by little with the spoon or spatula. For vulcanite work it is not necessary to build the model very high; a half inch above the highest point of the palatine arch is amply sufficient. A very good plan to make a model is to take a strip of paper two inches wide by twelve inches long and wrap or fold this evenly all around the outer rim of the impression in the cup, holding it close to this with the fingers of the left hand, and into the receptacle thus formed, conveying the plaster with the spoon in the right hand. When the plaster sets moderately, the paper may be unwound, leaving the model neatly made, and requiring but little after trimming. The model being thus made, and the plaster having set hard, it may generally be removed from the impression by striking it, or the model, a few raps with a small wooden mallet. If these should fail to part the two, it will be necessary to cut away the impression piece-meal, so as to remove it from the model. This must be done carefully, so as to avoid cutting or defacing the model with the knife.

Some operators use a coloring material with their impression plaster, so as to form a line of demarcation between the two. Although this is a safer plan, it is not absolutely necessary, as the varnish used for painting the impression sinks into this and serves as a guide in the removal or parting of the two. To remove a model from a wax impression it is simply necessary to place all in a bowl of hot water of 130° F. to soften the wax, when they are easily parted. For modelling compound the water is used hotter. The model being removed from the impression, a base plate is moulded on it by softening a half sheet of base plate wax, and pressing or moulding this with the fingers all over the face of the model. It is then cut to the proper size with a heated wax knife, (Fig. 6) and a rim of articulating

wax laid on and secured to this base plate running from heel to heel, as represented by Fig. 7.

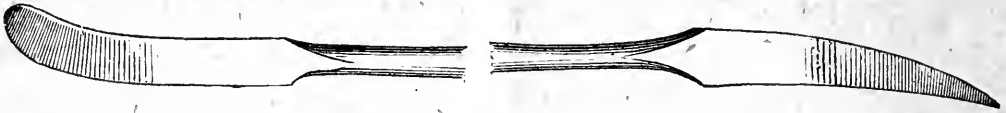


FIG. 6.

Some operators—and these the most careful—swedge up a plate for each case, whether for vulcanite or for metal work, by making dies and counter dies for the purpose. For vulcanite work they use a plate of pure tin, which is easily swedged. By this they are sure of a fit before the whole of the work is completed, which would not be the case if this be not done. The base plate being made by either mode, is prepared with the articulating wax, as has been described, and is then placed in the patient's mouth to obtain what is termed

THE BITE.

When the base plate, with the articulating wax attached to it is placed in the patient's mouth, she should be directed to close the lower teeth *gently* against it. The lips should be brought over this wax nicely, and a close scrutiny made of the features. Should this articulating wax be found too full, so as to puff out or protrude the lips, it should be marked where the fullness exists, removed from the mouth, laid on the model, and cut away sufficiently so as to reduce the fullness. On the other hand, should it be found that the features are not fully restored to their proper fullness or contour by this articulating wax, it should be marked where the fullness is required, removed from the mouth, laid on the model, dried thoroughly of the saliva adhering to it, and more wax added at the point requiring the fullness. This articulating wax should likewise be cut to the proper length, so as to be a guide as to the length for the teeth that are to be supplied. For this purpose the

patient should be engaged in conversation with the operator, made to talk, smile and laugh, so that he may observe the length of the articulating wax, and either add to or cut away from it, until it is of the proper length. This being all determined, the patient is directed to bite *slightly* into the articulating wax, only so much as to leave a slight indentation of the lower teeth into it. At Fig. 7 are seen the inden-

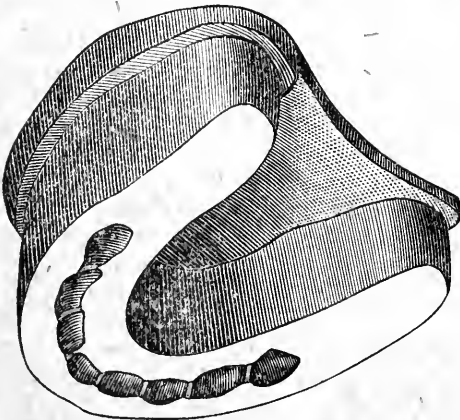


FIG. 7.

tations left in the wax by the lower teeth. The median line is now marked on the articulating wax, and the base plate removed

and laid on the model. Some wax is now softened and put into a lower impression cup and an impression taken of the lower teeth, from which a model is made. When this has set hard, it is immersed into a bowl of warm water to soften the wax, and the model of the lower teeth removed from this wax impression. The teeth of this lower model are now put into the indentations left on the articulating wax by the teeth of the patient, which it exactly fits.

Some operators do not go to this trouble, but it is by far the best and most intelligent way of working. The bite thus obtained is now fastened to the articulator (Fig. 8.)

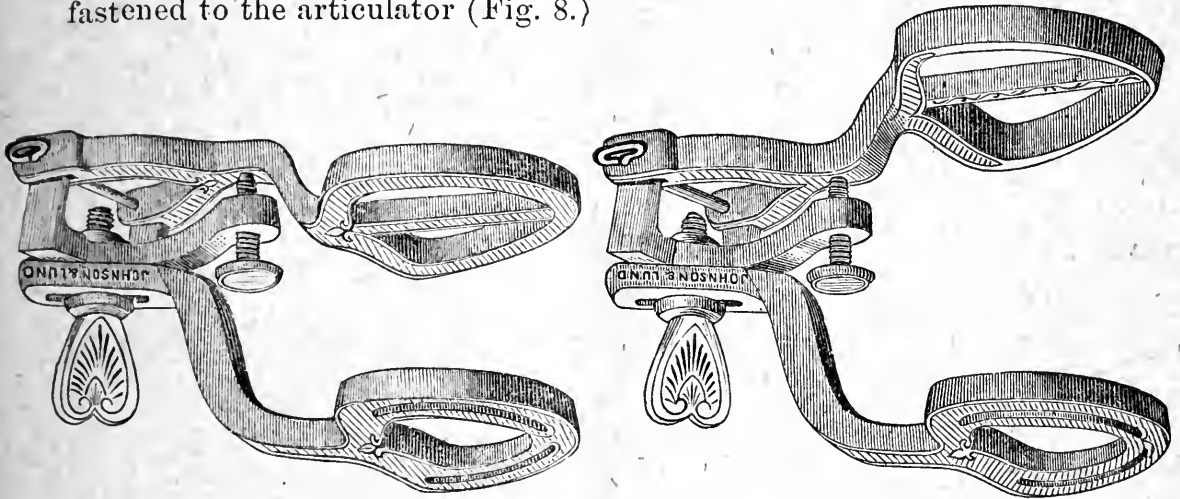


FIG. 8.

A word may be said in reference to this articulator. By inverting the upper part it will accommodate both thick or thin models, which is quite an advantage, as when thick models are used, as in gold-plate work.

[TO BE CONTINUED.]

THE DIETETIC VALUE OF WATER.

BY GEO. B. FOWLER, M.D., N. Y.;

PROF. OF CLINICAL CHEMISTRY, N. Y. POLYCLINIC; VISITING PHYSICIAN TO THE N. Y. INFANT ASYLUM, THE RANDALL'S ISLAND HOSPITALS, ETC.

Water is the essential element for the manifestation of physiological phenomena. Hoppe-Seyler very aptly says that all organisms are surrounded by running water.

I venture the statement that the cause of one-fourth the cases of disordered digestion in fashionable life is a lack of sufficient water in the dietary. It has become customary with men to substitute at their meals wines and liquors, and women, if they do not indulge in these, draw the line at a few sips of ice water, fearing, as they say, that water freely indulged in will produce obesity, or, by diluting the digestive fluids, induce dyspepsia. I am aware that such doctrines have been promulgated by high authorities, but am nevertheless firmly convinced that they are pernicious fallacies. It only needs a little common sense and observation to controvert them.

Who of us has not met with a case like this: A lady of thirty-five years, wealthy and worldly. When young, and a resident of the country, noted for her beauty of form and face. Now after ten years of city life, is wan and yellow. Her integument and muscles are shrunken and pasty; her eyes deep set and surrounded by dark rings of wrinkled skin. The prominent abdomen is the only relic of her former rotundity, now due, however, to flatulence and impacted feces.

You question her, and she relates a doleful story of weariness, anorexia, constipation, "nervousness," headaches and backaches, irregular and scanty menstruation, scalding urine, piles, flatulence, heartburn, palpitation, etc. She informs you still further, that she never drinks water, having been instructed to that effect by her former physician; that she voids a couple ounces of high colored urine about three times a day, and gets rid of a few masses of hardened feces, after an enema, twice a week.

Now I regard such an organism as this as surrounded not by running water, but by inspissated mucus. Of course various causes have brought about this mummyfied wreck, chief among them indigestion from lack of water. These are just the cases which respond so satisfactorily to the hot water treatment, or to a sojourn at a mineral spring. In either case the needful is supplied, and by proper guidance in other matters health is soon restored.

It may safely be said that water is the most important of all substances supplied as food. Animals and men survive upon it longer than upon any other single alimentary principle.

The importance of a full supply of this material is easily understood when we glance at the role it plays in the economy. In the first place, water constitutes 70 per cent. of the body weight, distributed as follows:

PERCENTAGE OF WATER IN	
Teeth	10
Bones	13
Cartilage	55
Muscles	75
Ligaments	76
Brain	79
Blood	80
Synovial fluid	81
Bile	88
Milk	89
Pancreatic juice	90
Urine	94
Lymph	96
Gastric juice	97
Perspiration	98
Saliva	99

Water gives mobility to the fluids, dissolves and carries in solution the various substances intended for nutrition or destined for excretion. It supplies rotundity and flexibility to the body as a whole; strength and elasticity to the muscles, bones, ligaments and cartilages; through its agency exchange of matter and tissue metabolism is effected. In short, I repeat, it is only by the presence of water in proper proportion in all the tissues and fluids of the body that the

physiological phenomena which characterizes health can take place. Milk, the sole food of animals during a period of most active physiological changes, contains 85 per cent. of water.

A healthy adult excretes about 90 ounces of water per day, as follows :

Lungs	14 ounces.
Skin	26 "
Urine	50 "

That means that these proportions must be supplied in order that the vital processes may operate effectively and normally.

How is it done? Fifteen or twenty ounces are combined with the solid food, and therefore we must take as beverage each day seventy or seventy-five ounces.

The habitual substitution of wines, malt liquors, etc., for water is pretty sure in the long run to result in evil, in the majority of cases. For, in the first place, where pure or undiluted wine is drunk the individual is not disposed to take enough to supply the system with the requisite amount of fluid, and if he should everything is upset by the pernicious effect of the contained alcohol. Beer, though containing less alcohol, is open to the same general objections. It should never permanently, or for any lengthened period, be allowed to take the place of pure water. All these beverages are unnatural solvents; besides water they contain many ingredients intolerant to most alimentary canals. Especially is this true in those persons already suffering from deranged digestion.

Water taken at meals in quantities sufficient to satisfy the thirst acts only beneficially. Indeed, an excess will not hurt; for it is quickly absorbed, and increasing the blood pressure favors digestion by thus inducing a freer flow of the juices. It is a digestive agent as well as a food. By the liberal use of water as a beverage the feces are rendered of proper consistency, the intestines maintain their normal activity, and constipation is avoided. The passage of from thirty-five to fifty ounces of urine each day, the result of the ingestion of pure water, tends to keep the kidneys and urinary passages clear of concretions and morbid changes, and with the skin and lungs equally active, the bodily house is well swept. The same result is impossible with artificial beverages. He who stints himself in the drinking of water is dirty inside.

THE INFLUENCE OF EXERCISE UPON HEALTH.

BY PROFESSOR EUGENE L. RICHARDS, OF YALE COLLEGE.

Many old theories of education are being mercilessly discussed. Many new theories claim the places of the old. The classical scholar still claims for the ancient languages the greatest educational power. The advocate of modern languages says life is too short to study dead

things, and that modern languages furnish enough discipline, and are, besides, useful. To the scientist, science is god of all, even of education. To him no man is properly educated unless his mind is stored with scientific ideas and trained by the scientific methods of the nineteenth century. Languages, ancient and modern, mathematics, science, philosophy, all advance their claims to be the best educators of the coming man. Meanwhile the coming man is nothing but a child, and must submit himself to his elders to be experimented upon according to the theories of teachers or parents.

For men, women, and children alike, I wish to enter a plea for a part of them much neglected in most discussions on education, and too much left out of sight in most theories of education—the body. In fact, for centuries past, many educators have seemed to regard the body as a rival of the brain, if not an enemy of it. They have apparently been filled with the idea that strength and time given to the body are strength and time taken from the mind. Unfortunately for the cause of good education, this erroneous idea is not held by teachers alone, but is a very prevalent one generally, the current dictum being that, representing by unity a person's force, whatever part of this unit is taken for the body leaves necessarily just that much less for the mind.

To combat this idea, and to replace it by a much more reasonable idea, I had almost said by the *very opposite idea*, shall be the chief though not the only aim of these pages.

To all races which have shown power in any direction the main source of that power has been physical. This is acknowledged to be true with regard to the conquering races of the past. With regard to the present we are too apt to think that the progress of civilization has changed the conditions of power, so that races physically weak, if they are only wise, can successfully compete with and finally overcome the strong races.

Take the Greeks. For along time they were a conquering race—masters of the world of their time. But their influence has extended far beyond their day and beyond the limits of their little world. "It is no disgrace to a nineteenth-century American to go to school to the Greeks. They are still, in their own lines, the leaders of mankind. They are the masters." "Attica was about as large as Rhode Island. Rhode Island is a noble little Commonwealth. Yet it has enjoyed political liberty longer than the democracy of Athens lasted, and in the midst of the blazing light of this much-lauded century. What now is or will be the influence of Rhode Island on the world's history compared with the unmeasured and imperishable influence of Athens? Whence the difference?" * The causes of the differ-

* Professor George P. Fisher, "Princeton Review," March, 1884.

ence were manifold. One cause was their physical education. Hand in hand with their mental discipline, which was simple but thorough, went gymnastic exercise. "Until the time of Alexander, the main subjects of education among the Greeks were music and gymnastics, bodily training and mental culture. . . . The first duty of a Greek boy was to learn his letters, a feat which was also coincident with learning to swim. . . . By the fourteenth year the Greek boy would have begun to devote himself seriously to athletics."* Could such a careful and continuous training of the body fail to have its effects upon the mind? It gave the body power. It gave the brain force. Had this force not been converted all the while into intellect and æsthetic sense the Greeks would have formed a race of fine animals only. But their mental discipline saved them. Unfortunately for the permanence of the Greek power, that power was not built upon a moral basis. When, by means of their conquests, wealth and luxury came to them, the Greeks met the usual fate of nations weak in the moral sense. Their discipline was relaxed, and they succumbed to the strong.

The training of the Romans was largely physical. They were trained for war. But they, too, were overcome by stronger races when they relaxed their own discipline and gave up their martial games and athletic exercises—hiring gladiators for their sport and mercenaries for their battles.

What are the conquering races of to-day? Are they not the nations strong in body—strong by inheritance and keeping their strength by exercise? Germany keeps her men strong in the army by compulsory gymnastic drill. Her schools teach gymnastics. Many of her inhabitants in the cities maintain their strength by the exercise which they have in their excellent Turner system.

England has in the bodies of her children the blood of those old rovers who were the terror of the coasts of Europe in the early centuries of the Christian era, mixed with the blood of that vigorous native stock, to subdue which, even when furnished with only barbarian arms, was no easy task to the Roman legions with all their military skill. In England, too, this physical force is still maintained by vigorous exercise taken by all classes. The higher classes have their out-of-door sports, and some of them of the roughest kind. The lower classes also have their sports. Wherever the English race goes it carries with it the love of exercise and the practice of it. Even their women engage in it. Some of them follow the hounds. They pull the bow. They take walks, the length of which would shame many an American man. So the vigor of the stock never decays. The race increases and multiplies. The little island can not hold it. Away it

* "Educational Theories," by Oscar Browning.

goes to conquer and colonize the globe, and to infuse its strength into all the races of the earth.

What keeps us as a nation from deterioration? The bone and sinew of the land—the cultivators of the soil—the conquerors of our new land—the men who build our cities and the great highways between them, who dig our coal and labor with hand and body in all our factories. It is true that brain directs all this activity, but muscle is the motive power. And the muscle of one generation is the source and support of the brain-power of the following generations. "What else accounts for the prodigal activity"* of the descendants of the early settlers of this country, but the fact that obliged, when cast on a land like our, to battle with the elements and conquer the forests by their own bodily strength, they lived an out-door life in the main, and stored up an immense "capital of vitality" which they handed down to their posterity? Some of that posterity are not content to use the interest of that capital, but are spending the principal. What is the consequence? Not only an enfeeblement of body, and mind, but sterility; and thus, many of the old New England families are dying out in the homes of their race, and are giving place to the strong new-comers.

As to individuals, what kinds of men fight their way to the front ranks in all callings, and hold their places there, as men eminent in their day and generation? Men of strong body. Consider the premiers of England—men like Brougham, Palmerston, and Gladstone—working at an age when many a weaker man would either be in his grave or be preparing for it! Some exercise—horseback-riding or felling trees—keeps up their strength long after three-score and ten. It is only necessary to mention Washington, Jackson, Webster, and Lincoln, to call attention to the fact that among eminent American public men vigor of mind and vigor of body go together. Notice the great pulpit orators of to-day—such as Spurgeon, Beecher, John Hall, and Phillips Brooks. Among moneyed men, did not Commodore Vanderbilt owe something of his vast fortune to his strong body? Could he have endured the strain of building that fortune, and would he have had the vigor to extend it, had it not been for the out-door life of his early manhood? If you find a really successful man, who builds and keeps either a reputation or a fortune by honest hand work, he is generally a man of vigorous body. "All professional biography teaches that to win lasting distinction in sedentary in-door occupations, which task the brain and nervous system, extraordinary toughness of body must accompany extraordinary mental power."† Again, "To attain success and length of service in any of the learned professions, including that of teaching, a vigorous body is well-nigh essential."‡

* S. Weir Mitchell, in "Wear and Tear."

† President Eliot, in "Annual Report for 1877-'78."

‡ President Eliot.

It would be out of place to advise a farmer who is already tired of digging and plowing, or a mason who has had enough of bricklaying, to exercise his body. A little play to limber the stiffened muscles might be a good thing. A little brain-work might be better. But of real hard-working exercise of body each workingman gets enough from his day's labor. If he only get good food and enough of it, and have time for sufficient sleep, and get pure air to breathe, and clean water to drink and to bathe in, he will do well enough, as far as bodily health is concerned. But to brain-workers and to all persons of sedentary habits it can be truly said that vigorous exercise of the entire body is not only advisable if they would enjoy health, but that it is absolutely essential to that life. The London "Times," of December 11, 1882, records the physical and mental deterioration which has fallen on the civil servants of India, described by an Indian correspondent: "Since the institution of competitive examinations, out of a hundred-odd civilians nine have died and two have been forced to retire on account of physical debility. Ten more were considered quite unfit for their work on account of bodily weakness, and eight have positively become insane."* Here is a record of twenty-nine out of a hundred persons physically deficient. The hundred belonged to one of the strongest races of the earth. Does not the fact testify to the great demands of civilization on the vitality of the people of modern times? But it will be replied that the climate of India had something to do with the facts. Well, read what Dr. E. H. Clarke says of our country: "No race of human kind has yet obtained a permanent foothold upon this continent. Mounds at the West, vestiges in Florida, and traces elsewhere, proclaim at least two extinct races." "The Indian whom our ancestors confronted was losing his hold on the continent when the Mayflower anchored in Plymouth Bay, and is now also rapidly disappearing. It remains to be seen if the Anglo-Saxon race, which has ventured upon a continent that has proved the tomb of antecedent races, can be more fortunate than they in maintaining a permanent grasp upon this Western world. One thing, at least, is sure: it will fail, as previous races have failed, unless it can produce a physique and a brain capable of meeting successfully the demand that our climate and civilization make upon it."† Read the following facts with regard to Chicago: From 1852 to 1868, population increased 5.1 times what it was in the first period. The death-rate increased 3.7 times. The deaths from *nervous* disorders increased 20.4 times.‡ Chicago is perhaps a fast place, but the figures are significant of the wear of city life on the nervous system.

Is not this strain of the nervous system a peculiarly American

* Bonamy Price, in "Princeton Review," July, 1884.

† "The Building of a Brain," Dr. Edward H. Clarke.

‡ "Wear and Tear," Dr. S. Weir Mitchell.

danger? To be sure, all brain-workers in all countries are liable to it, but in our country climatic influences increase the tendency. Under these influences we have developed national characteristics showing in form and feature. We do things in a hurry. We are in haste to get rich. We are in haste to be wise. We have no time for exercise. We have no time for play. Both exercise and play are by serious people often looked upon as a waste of time for adults, however good they may be for children and young people. A boy must be a man before his time, and a girl must be prim and staid, and must not romp like her more fortunate brothers, but must be a sober woman after she has entered her teens. It seems as if the battle of modern life (at least of modern city life) was a battle of the nerves. "From nursery to school, from school to college, or to work, the strain of brain goes on, and strain of nerve—scholarships, examinations, speculations, promotions, excitements, stimulations, long hours of work, late hours of rest, jaded frames, weary brains, jarring nerves all intensified by the exigencies of our school and city life." * The worst of the mischief is, that this strain falls most of all upon those from nature and circumstance least able to bear it—upon our women. Public opinion frowns upon their exercising like men. Yet, with a nervous system more sensitive than man's, they need the very exercises (out-of-doors) which, by a mistaken public sentiment, they are often forbidden to take. The healthy house-work is often deputed to a servant either because too hard for our American girls, or too much beneath them.

Of the five agents of health—exercise, food, air, sleep, and bathing—exercise, to a certain extent, regulates the demand for the other agents. The muscles, when fully developed, constitute about a half of the full-grown body. The muscular contractions act upon the blood. The blood is the life-stream, carrying the atoms of nourishment to every part of the body, and receiving the waste particles which have already done their work. This process of depositing building substance and receiving waste matter goes on according to a law. This law, called, from its discoverer, the law of Treviranus, is—"Each organ is, to every other, as an excreting organ. In other words, to insure perfect health, every tissue, bone, nerve, tendon, or muscle, should take from the blood certain materials and return to it certain others. To do this, every organ must or ought to, have its period of activity and rest, so as to keep the vital fluid in a proper state to nourish every other part." † So that, if we give to the muscles their share of labor, as indicated by the ratio which they bear to the whole body, according to this law, we ought to give a large proportion of our waking hours to their use. But there are certain involuntary muscles doing their work all the time, night and day. In our usual

* "Physical Training," McLaren.

† "Wear and Tear," S. Weir Mitchell.

vocations, too, however confining they may be, we are obliged to take a certain amount of muscular exercise. Consequently, in the really necessary work of any ordinarily busy person, the muscles do have a fair share of exercise. Still, there are a number of muscles which are used almost exclusively, so that other muscles, with their connecting tendons, bones and nerves, fail, from sheer neglect, to contribute to the health of the whole body. How many women exercise fully the large muscles of the back and loins, or the muscles of the abdomen? Women who wash, or those who work in field or garden. Yet these important muscles, when used, contribute much not only to the health of the body in general, but also to the vigor of the organs lying underneath them. So, too, in walking, how few use the muscles of the calf of the leg? Most people merely stamp along the path or road. They do not use the foot from heel to toe. They fail to rise on the toes at the end of the step, and do not push themselves along with those important members of the foot. Thus they lose the best part of the leverage of that important muscle or set of muscles of the lower leg. The fault is frequently in the shoe of the walker. That has too high a heel, and pinches the toes, making any movement of them painful, even if it does not prevent them from moving at all.

By making regular daily use of the muscles—of all the muscles, if that were possible—we should do one thing toward establishing perfect health of body by allowing to one very large part of it a fair chance to appropriate its proper elements from the blood, and opportunity to give back its used-up tissue to be eliminated from the system in natural and healthy ways. We should be doing more than simply repairing the muscles. We should be also evolving heat—a very important factor of life. We should be assisting all the other parts of our organization to do their work.

Take the heart—itsself a very bundle of muscular fibers. We know that as long as we live, whether sleeping or walking, that wonderful organ keeps up its regular contractions and expansions. But, when we use our muscles, their contractile force upon the blood-vessels helps the blood along its channels, and thus takes a little labor from the propelling heart. It beats faster but with less effort.

While helping the heart, muscular exercise helps the lungs also. More exercise means for the lungs more breath; that is, more air inspired, and more carbonic acid gas expired. By deeper breathings the involuntary muscles are strengthened. Moreover, we are made to feel the need of greater lung-room. Even after the age when full stature is supposed to be attained, that lung-room often comes, Nature furnishing the supply according to the demand. McLaren notes the case of one man, in his thirty-sixth year, whose chest, under

systematic exercise, increased in girth from thirty-two to thirty-six and a half inches in *two* months. There was an addition of four and a half inches to the circumference of the chest. "An addition of *three* inches to circumference of chest implies that the lungs, instead of containing 250 cubic inches of air before their functional activity was exalted, are now capable of receiving 300 cubic inches into their cells." * This great increase, of four and a half inches, meant not only increase of lung-room, but increase of lung-power.

Taking the quantity of air inspired in the reclining position in a given time as the

1 nit	1
In the same period of time the quantity of air inspired when standing is	1.33
When walking one mile per hour, is	1.9
When walking four miles per hour, is	5
When riding and trotting, is	4.05
When swimming, is	4.33

[TO BE CONTINUED.]

AMALGAM.

BY THEODORE F. CHUPEIN, D. D. S., PHILADELPHIA.

There is scarcely a dental journal we receive, but its advertising pages are crowded with notices of different amalgams, or alloys, each purporting to be the *best*, and possessing attributes of non-shrinkage, non-discoloration, preservative qualities, harmony with tooth, bone, etc., etc. Their names have become "Legion." These preparations sell variously from *two to five dollars an ounce*. Under these circumstances it would be a real service to the profession if we give an unbiased judgment of the merits of such as are most popular. For many years we have been using amalgams of various makes: Lawrence's, Flagg's Standard, Chicago Refinery Company's alloys, Welsh's Gold and Platina Alloy, Caulk's Par-Excellence, Sibley's Gold and Platinum Alloy, Johnson & Lund's Extra Amalgam, Virgin White Alloy, Dibbles' White Amalgam, Sullivan's Copper Amalgam, Townsend's Amalgam, Chase's Alcohol Tight Amalgam, Bonwill's Amalgam with prepared mercury, etc., etc., and we have kept a record of their behavior in the mouth. We have used these and kept a record of them to test their claims of non-shrinkage and non-discoloration.

Which is the best amalgam?

The best amalgam according to our idea is that which preserves the tooth in which it is placed best. We regard this as the *first* attribute irrespective of all others, and this attribute we find in *Sullivan's Copper Amalgam*, or "Sullivan's Cement," as it is called. This Amalgam lays no claim to non-discoloration (for it turns very

* "University Oars," Dr. Morgan.

† "Health," Dr. Edward Smith.

black in the mouth) but for non-shrinkage and preservative effects we have never used anything equal to it. In cavities difficult of access, in cavities where moisture cannot be entirely excluded, in posterior teeth, or in the distal cavities of the bicusps and molars, it may be used with the most gratifying results.

Lawrence's amalgam is good, shrinks a little but does not hold its color. Welsh's Gold and Platinum alloy is good also, but shrinks and holds its color only passibly. Chase's alcohol tight amalgam shrinks but little, and holds its color well. Bonwill's amalgam discolors badly, nearly as black as Sullivan's copper amalgam, and shrinks also. Johnson & Lurd's extra amalgam holds its color well and shrinks but very little. Townsend's amalgam holds its color well and shrinks but little.

It is known that any good amalgam can be manufactured from seventy-five to eighty-five cents per ounce, unless a large quantity of gold enters into its composition, which does not seem, as far as our observation goes, to increase, either its non-shrinkage or non-discoloration. We were inclined to think that high priced amalgams *might* possess better qualities, particularly that of *non-discoloration*, but our observation has proved, in this regard, that they are no better than others. Thus we have found that Dibbles' white alloy at five dollars an ounce did not keep its color as well as Extra amalgam at three dollars, or as well as some of Townsend's amalgam (which was made for seventy-five cents per ounce by Dr. W. H. Trueman and given us to try), or as well as some of Chase's alcohol tight amalgam made by ourselves (according to the formula of Dr. Chase) at eighty-five cents per ounce.

The above is the result of observations we have made extending through six or eight years.

Which is the best way to use amalgam?

We give our mode of filling a tooth with amalgam.

We first apply the rubber dam and then prepare the cavity of decay. We make under cuts in these, but not retaining pits. This being done as carefully as possible, we pour into the palm of the hand a globule of mercury about as large as the cavity, and mix with this the amalgam filings, rubbing these together until they form a paste as stiff as putty. We then put this in a mortar and add a little more of the amalgam filings and with the pestle rub the extra filings into the mass, that was amalgamated in the palm, until all are incorporated. *We use considerable force with the pestle when doing this.* The alloy is now taken from the mortar pretty dry, but we press and mould it into a ball or pellet and place it between chamois skin or a linen napkin and then with a pair of heavy flat nose-pliers we squeeze it flat and exclude as much of the mercury as we can by hard pres-

sure. In this form it is laid on the bracket table, and with a knife or any sharp instrument it is cut up into small pieces from the size of a "mustard seed" to a "duck" shot. With the tweezers these are carried to the cavity and condensed into it with warmed (not hot) instruments. The warming of the instruments makes the amalgam quite plastic so that it can readily be moulded into the cavity or indeed nicely contoured if need be. We have found that amalgam worked in this way is less liable to shrink and yields better results.

THE PRACTICAL PLACE.

THE TOBACCO CURE.—"By the by," remarked Dr. Spitzka, a day or two ago, to a New York *Post* reporter, "you may state that tobacco is likely to prove a great boon in tetanus. It has been successfully employed in relaxing the rigidity of the muscles. It may be employed in various ways. By taking a piece chipped from plug tobacco and steeping it in tepid water it is rendered soft. If then it be placed at the pit of the stomach it produces nausea and relaxation of the muscles. It may be placed with advantage in other positions, and, by continuing this treatment, relaxation may be rendered permanent. So powerful is this remedy that it has been successfully employed in the army in reducing dislocations. To give you an idea of the power of the leaf, if a man should swallow his cigar, and not be able to eject it, he might as well make his will—no power on earth could save him."

Tobacco has also been employed, it is said, successfully in colic, and it is believed that its soothing and relaxative effects may prove beneficial in false hydrophobia.

THE HUMAN FAMILY.—[From the New York *Commercial News*.]
—The human family living to-day on earth consists of about 1,450,000,000 individuals; not less, probably more. These are distributed over the earth's surface, so that now there is no considerable part where man is not found. In Asia, where he was first planted, there are now approximately about 800,000,000, densely crowded; on an average, 120 to the square mile. In Europe there are 320,000,000, averaging 100 to the square mile; not so crowded, but everywhere dense, and at points over populated. In Africa there are 210,000,000. In America, North and South, there are 110,000,000, relatively thinly scattered and recent. In the islands, large and small, probably 10,000,000. The extremes of the white and black are as five to three; the remaining 700,000,000 intermediate brown and tawny. Of the race 500,000,000 are well clothed—that is, wear garments of some kind to cover their nakedness; 700,000,000 are semi-clothed, covering in-

ferior parts of the body; 250,000,000 are practically naked. Of the race 500,000,000 live in houses partly furnished, with the appointments of civilization; 700,000,000 in huts or caves with no furnishings; 260,000,000 have nothing that can be called a home, are barbarous and savage. The range is from the topmost round—the Anglo-Saxon civilization, which is the highest known—down to naked savagery. The portion of the race lying below the line of human condition is at the very least three-fifths of the whole, or 900,000,000.

CLEAR SHELLAC VARNISH.—To get an absolutely clear solution of shellac has long been a desideratum, not only with microscopists, but with all others who have occasional need of the medium for cements, etc. It may be prepared by first making an alcoholic solution of shellac in the usual way; a little benzole is then added, and the mixture well shaken. In the course of from twenty-four to forty-eight hours, the fluid will have separated into two distinct layers, an upper alcoholic stratum, perfectly clear, and of a dark red color, while under it is a turbid mixture containing the impurities. The clear solution may be decanted or drawn off with a pipette.—*National Druggist*.

A GOOD IDEA.—Some one in the London *Field* suggests that “if a man wants a carriage or implement photographed so as to make a working copy to scale, all that is necessary is, when the photo is being taken, that a clear and distinct 3-foot rule be placed on the carriage, this is photographed along with the carriage, and no matter what the size of the print or negative, will always be a true scale. It enlarges and diminishes in exactly the same proportion as the carriage.

ILLUMINATING WATER BY ELECTRICITY.—At the new Cirque Nautique in Paris there is an aquatic performance of a very novel character. After the conclusion of the ordinary gymnastic and riding entertainment, the carpet is removed from the floor of the ring, and the latter entirely submerged. A circular pond is thereby produced, and an electric arc lamp illuminates the water from below. The swimming performers appear like mermen and mermaids in the translucent depths of the sea. The general installation throughout the building is a very fine one, and includes both arc and incandescent lamps, the lamps soleil producing a beautiful effect.

RESTING AFTER MEALS.—A friend of the writer's, who has suffered from dyspepsia during almost her entire life, considers the suggestions in the following extracts from an article in a recent issue of *The Journal of Health* to be the most in accord with her own experience of anything on the subject lately published.

Hurried eating of meals, followed immediately by some employment

that occupies the whole attention and takes up all, or nearly all, of the physical energies, is sure to result in dyspepsia in one form or another. Sometimes it shows itself in excessive irritability, a sure indication that nerve force has been exhausted; the double draught in order to digest the food and carry on the business has been more than nature could stand without being thrown out of balance. In another case, the person is exceedingly dull as soon as he has a few minutes of leisure. The mind seems a dead blank, and can only move in its accustomed channels, and then only when compelled. This, also, is an indication of nervous exhaustion. Others will have decided pains in the stomach, or a sense of weight, as if a heavy burden was inside. Others, again, will be able to eat nothing that will agree with them; everything that is put inside the stomach is made the subject of a violent protest on the part of that organ, and the person suffers untold agonies in consequence. Others suffer from constant hunger. They may eat all they can, and feel hungry still. If they feel satisfied for a little time, the least unusual exertion brings on the hungry feeling, and they can do no more until something is eaten. It is almost needless to say that this condition is not hunger, but inflammation of the stomach. Scarcely any two persons are affected exactly in the same way, the disordered condition manifesting itself according to temperament and occupation, employments that call for mental work, and those whose scene of action lies indoors, affecting persons more seriously than those carried on in the open air and those which are merely mechanical and do not engage the mind.

All, or nearly all, of these difficulties of digestion might have never been known by the sufferers had they left their business behind them and rested a short time after eating, instead of rushing off to work immediately after hastily swallowing their food.

Nature does not do two things at a time and do both well, as a rule. All know that when a force is divided, it is weakened. If the meal were eaten slowly, without pre-occupation of the mind, and the stomach allowed at least half an hour's chance to get its work well undertaken before the nervous force is turned in another direction, patients suffering from dyspepsia would be few.

A physician once said: "It does not so much matter what we eat as how we eat it." While this is only partly true, it certainly is true that the most healthful food hurriedly eaten, and immediately followed by work which engages the entire available physical and mental forces, is much worse than a meal of poor food eaten leisurely and followed by an interval of rest.

BACILLUS OF CONSUMPTION.—Dr. Cantani, of Naples, having in mind the fact that bacillus of consumption is destroyed when other bacteria

are grown in the same soil, has proposed to eradicate consumption by introducing into the system other bacilli which are injurious only to the germs of the disease. If an organ of the body be attacked by a bacillus dangerous to human life, he would introduce another, harmless to man but fatal to the destructive bacillus. In the case of a consumptive patient, Dr. Cantani introduced a harmless organism, known as the *Bacterium termo*, and found that the *Bacillus tuberculosis* gradually disappeared from the patient's expectorations. The widespread desolation wrought by consumption is more than sufficient to urge the strongest effort on the part of the medical fraternity to discover a successful treatment. It may be possible that this suggestion will bear fruits of the greatest importance. We hope, at least, that it will receive careful investigation.

LITERARY NOTES.

AN INDEX TO THE PERIODICAL LITERATURE OF DENTAL SCIENCE AND ART. As presented in the English language, by I. Taft, M. D. D. S. Octavo edition 1886. Published by P. Blakiston, Son & Co., Philadelphia, Pa. It contains 212 pages.

This volume is really a boon to all practitioners of Dentistry, as being a means of readily directing the searcher after information, where he may find his inquiries answered. The work is divided into three parts, containing (1) an index to the periodical literature of Dentistry, (2) an index to Dental Periodicals, (3) an index to authors. The scope of the volume extends from the year 1839 to the beginning of the present year. The work is gotten up in the usual fine style of its publishers, and we trust a copy of the same will be in the hands of all practitioners and students of dentistry.

A PRACTICAL TREATISE ON MECHANICAL DENTISTRY. By Joseph Richardson, M. D., D. D. S. Fourth edition, revised and enlarged, with 458 illustrations. Octavo size with 703 pages and index. Published by P. Blakiston, Son & Co., 1886. Price, in cloth, \$4.50; in leather, \$5.50.

This time-honored book appears before us again enlarged and well revised. It is a volume indispensable both to the student and practitioner and its place as a text book on Mechanical Dentistry has never been more well and thoroughly filled. The present edition gives considerable space to the various modes of pivoting teeth, which is so opportune at the present time when this subject arrests the thoughts of the profession to such an extent; while its "first cousin" crown and bridge work is as thoroughly treated. In all the other departments

of mechanical, or as it is now termed "Prosthetic" dentistry, the work is elaborate and reliable in its details and description. No student could afford to be without a copy of this valuable work, and the present edition makes it still more indispensable to both student and practitioner.

The volume is well printed with clear, bold, legible type and the entire make-up is creditable to the house from which it is issued.

PHYSICIANS' VISITING LIST, 1887. (Lindsay & Blakiston's.) Thirty-sixth year of its publication. P. Blakiston, Son & Co.

The fact of this little work of convenience for physicians having run through a yearly edition of *thirty-six years*, is a sufficient testimony of the acknowledgement which its service and utility is appreciated by medical men.

Besides the space which it contains for 'memorandas, refreshment of the memory, dates for visits, etc., etc., it has likewise much other valuable information of ready references. We cannot do better than to give its contents: Superior Lead Pencil, Calander for 1887 and 1888, Marshall Hall's Ready Method in Asphyxia, Poisons and Antidotes, A Description of the Metric or French Decimal System of Weights and Measures, Dose table, Disinfectants and Disinfecting, Examination of Urine, prepared by Dr. Judson Daland, based upon Prof. James Tyson's "Handbook for Practical Examination of Urine," List of Standard Reference Books, Incompatibles, Table for Calculating the Period of Utero-Gestation, List of new Remedies, Sylvester's Method for Artificial Respiration, illustrated, Diagram of the chest.

A glance at the above contents will show several new and practical features that have been suggested by experience, or by those who have used the Visiting List for many years. These additions have been made, however, without increasing the size of the book and without altering its character or general arrangement.

THE ARCHIVES OF GYNÆCOLOGY, OBSTETRICS AND PÆDIATRICS, New York, series of 1886 just completed, has met with such warm encouragement, the publishers have decided to issue monthly, and commencing January, the parts will so appear, instead of bi-monthly as heretofore.

HIGHLY IMPROVED MODELLING COMPOSITION

—FOR—

Taking Impressions of the Mouth, or any other purpose where
a Perfect Impression is required.



DIRECTIONS.—Soften the Composition in hot water, and when soft enough work into the desired shape with the fingers; place it in the cup, and then soften the surface with dry heat. This makes the surface softer than the main body, it takes a better impression, and hardens quicker. Should dry heat be used exclusively, wet the fingers occasionally, to prevent the Composition from sticking. It is not necessary to oil the impression before pouring the plaster cast, as the Composition can be easily removed by immersing for a few minutes in hot water.

No. 0.—EXTRA SOFT.—This grade is for restoring any of the other grades which have become hard by frequent use; they may be mixed in hot water.

No. 1.—SOFT.—This grade is for use in cold water and in tender mouths, and softens at a low heat; hardens in two minutes.

No. 2.—MEDIUM.—This grade is mostly used, and requires a higher heat to soften than No. 1, and sets quicker.

No. 3.—For use in hot weather, and requires a higher heat to soften than No. 2, and hardens quicker.

No 2 will always be sent unless other numbers are specified.

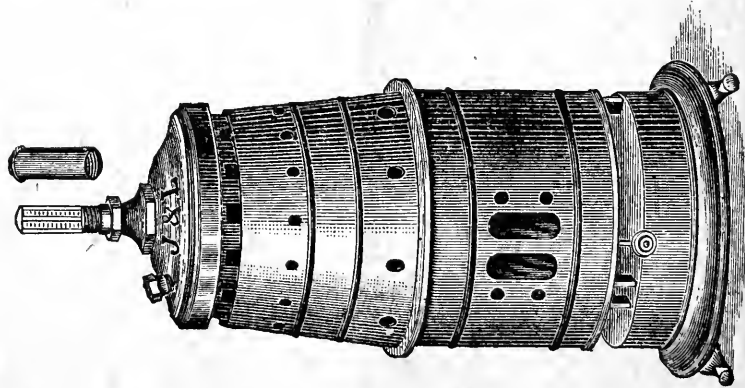
Price per pound....\$1.25 Per half-pound box....\$0.63

" five pounds purchased at one time..... 5.63

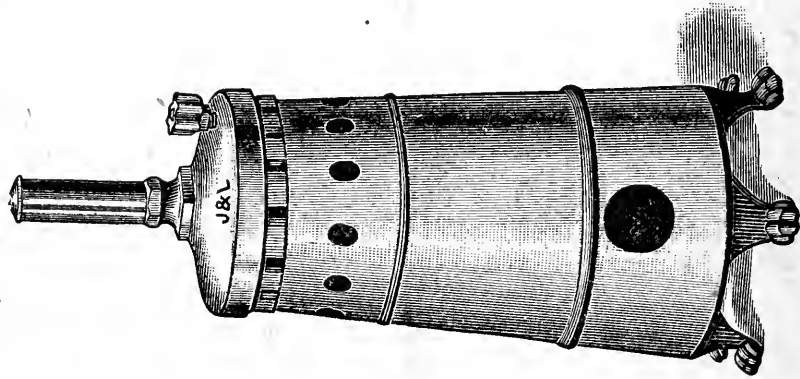
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IMPROVED VULCANIZERS.

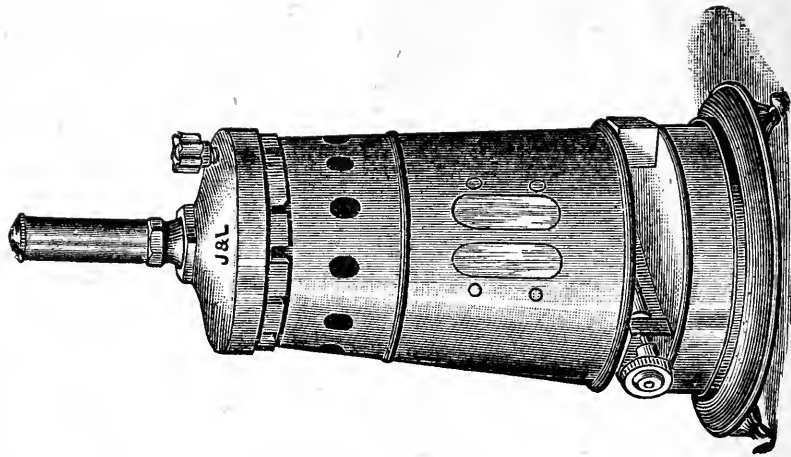
MERCURY BATH, BRASS FLASKS, ETC.



OUTFIT A.
 Rigged for kerosene with Union stove.
 One-case complete with Anchor Flasks etc.,...\$14.00
 Two-case ditto..... 15 00
 Three- case ditto..... 16.00



OUTFIT B.
 Rigged for kerosene with new attachment.
 One-case complete with Anchor Flasks, etc.,...\$13.00
 Two- case ditto..... 14.00
 Three- case ditto..... 15.00



OUTFIT C.
 Rigged for gas or alcohol.
 One-case complete with Anchor Flasks, etc.,...\$13.00
 Two- case ditto..... 14.00
 Three- case ditto..... 15.00

Improved Vulcanizers, Mercury Bath, Brass Flasks, Etc.

Donham's Spring Pressure accompanying Vulcanizer, adds \$1.25 to the Price.

These vulcanizers are made in the general style of the "Whitney." The boilers are of extra thick copper, and made much wider than those in ordinary use. The inside diameter of the JOHNSON & LUND Vulcanizer measures fully $4\frac{1}{4}$ inches, while the "Whitney" and "Hayes" measures but 4 inches. The great advantage of this increased diameter will be appreciated at a glance, as it enables the dentist to use the largest size of flasks when necessity demands it. That the profession may be thoroughly satisfied of the ample strength of these Vulcanizers, we assure them that each boiler has been tested by and sustained a hydrostatic pressure of 500 lbs. to the square inch; and as the elastic force per lb. to the square inch at 320° Fahrenheit (the degree at which dental plates are generally vulcanized), is but 88 lbs., our Vulcanizers are capable of resisting more than six times the strain required. But this liberality of resisting power is no excuse for carelessness on the part of the operator.

Johnson and Lund's Improved Vulcanizers are furnished with thermometer, mercury bath, one packing in place and an extra piece, extra disks for the safety-valve, requisite number of wrenches, malleable iron or brass flasks at option of purchaser. When no flasks are mentioned the brass ones will always be sent with the apparatus. We especially call attention to the flasks furnished with these Vulcanizers. They are of the pattern known as the **ANCHOR FLASKS**. Owing to their peculiar formation, an extra amount of room is afforded for the case to be vulcanized, and the bolts can be detached and replaced with great facility, without removing the screw from the nut.

PRICES.

Donham's Spring Pressure fitted to a Vulcanizer, adds \$1.25 to the Price.

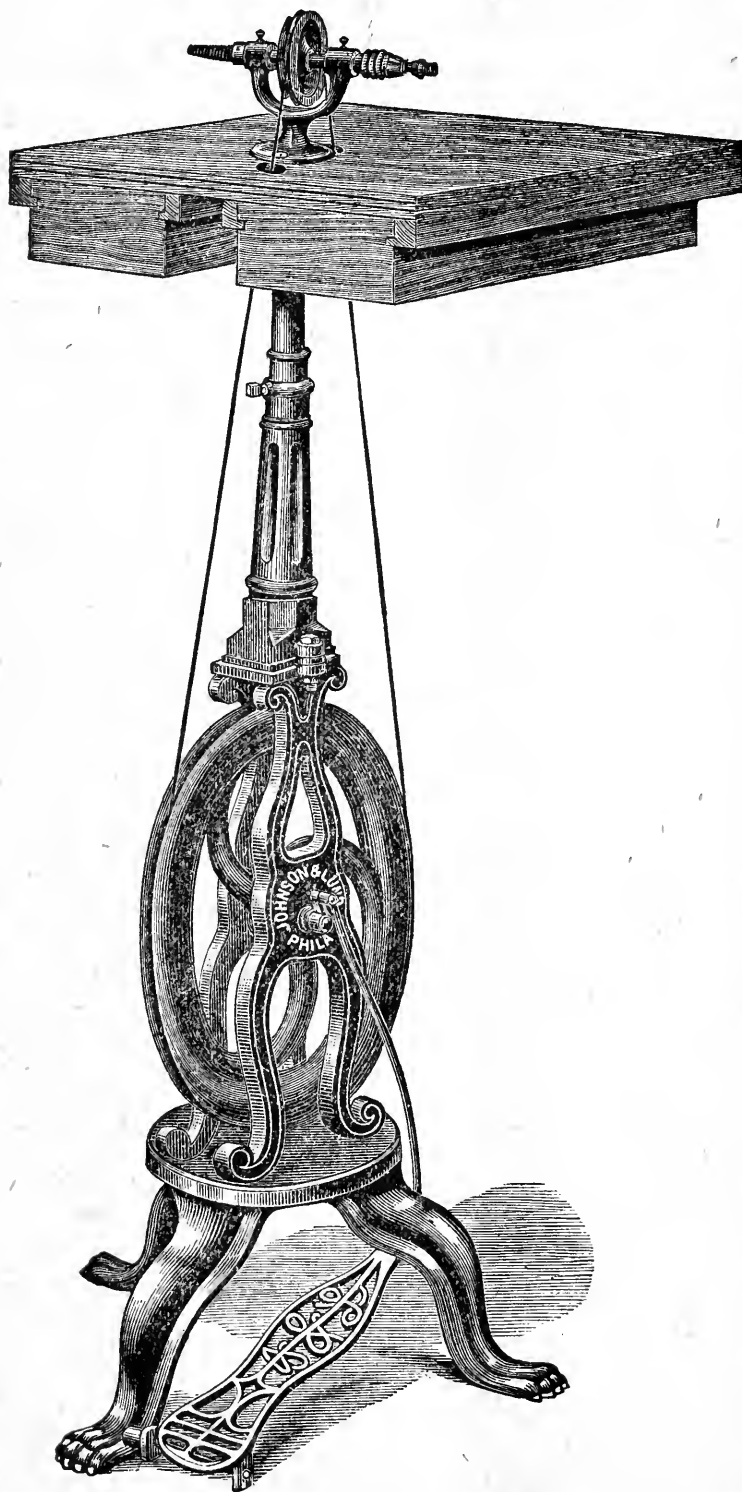
One-case Vulcanizer, copper boiler, furnished with thermometer, packing, jacket, lamp, disks for safety-valve, two flasks (either malleable iron or brass, at the option of the purchaser), and wrenches—complete for alcohol
 Ditto—complete for gas..... \$13 00
 Ditto—complete for kerosene..... 13 00
 Two-Case complete for gas..... 14 00
 " complete for alcohol..... 14 00
 " complete for kerosene..... 15 00
 Three-Case Vulcanizer—complete for gas..... 15 00
 " —complete for alcohol..... 15 00
 " —complete for kerosene..... 15 00
 If the stove part is furnished with the kerosene burner, when sold in connection with the Vulcanizer, there will be an extra charge of..... 1 00

NOTE.—The kerosene burner we are now furnishing with our Vulcanizer has but one burner; but that burner is four inches wide, instead of only two inches wide, which is the size of the burner belonging to the No. 1 Union Stove. This increased size makes the new burner equal to the two-burner stove, and at no increased expense.

No. 1 Union Kerosene Stove, with one burner two inches wide..... \$2 00
 " " " " four inches wide..... 2 25
 No. 2 " " " two burners each two inches wide..... 3 00
 Vulcan Gas Stove..... 1 50
 NOTE.—We make no allowance where Vulcanizers with malleable iron flasks are ordered instead of brass ones.

Two-Case Boiler, cover, thermometer, wrenches \$10 50	25	Felt Wicks for Union Kerosene Stove, 4 in. per doz.	\$1 00
Three-Case " " " " 11 50	25	Endless Packing, for J & L's Vulcanizer, each.	05
Two-Case Boiler, without cover and thermometer 6 00	10	" " " " per doz.,	05
Three-Case " " " " 7 00	\$1 00	Ordinary " " " " each,	60
Thermometer-Case and Tube, complete..... .50	50	" " " " per doz.,	10
Outside Thermometer-Case..... .50	25	" " " " " Hayes	60
Inside " " " " .50	25	Alcohol Lamp, for Vulcanizer.....	35
Cover, with Thermometer-Case and Thermometer 7 00	05	Jackets.....	75
" without " 5 00	10	Thermometers, each.....	25
New Ring to Boiler..... 2 00	06	Base, for either alcohol or gas.....	60
" Bottom to Boiler..... 2 00	60	Gas Burner for Vulcanizer.....	60

IMPROVED DENTAL LATHE, No. 1



In the construction of this Lathe we have introduced several novelties which only need be seen to be appreciated. In the first place, one end of the spindle is made with a split chuck and collar, which admits of the mandrels being changed with great facility and insures their running true; the other end of the spindle is made taper, to carry brush wheels, felt wheels, &c. In the next place, the table, which is made of solid walnut and fitted with two drawers, extends about $1\frac{1}{2}$ inches further in the rear of the head than it does in front of it, thus furnishing the dentist or operator with a sufficiency of table room upon which to lay articles that it is desirable to have at hand. The driving-wheel is fifteen inches in diameter, and weighs 24 pounds. This great weight and enlarged diameter, in combination with the small size of the pulley, assure its running with great ease, power and rapidity.

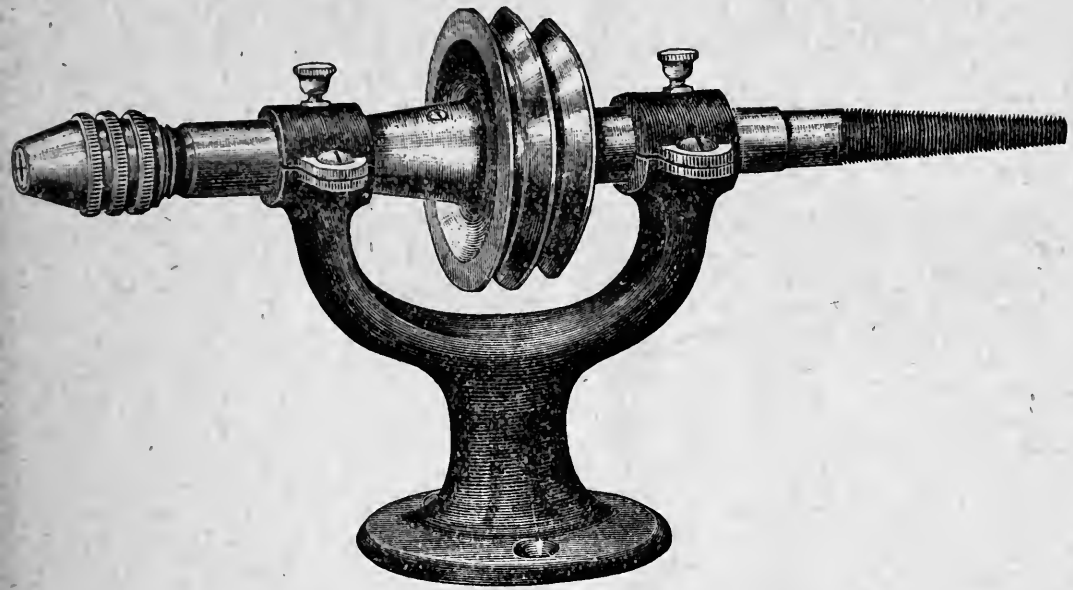
The column of the Lathe, being hollow, permits of the Lathe rising and falling over six inches, thus allowing the cord to be tightened without taking it off. Accompanying the Lathe will be found three mandrels, fitted with screws and brass shoulders, one for each size of the threads fitted in Johnson & Lund's Improved Metallic Centre Corundum Wheels. There are also three brass chucks which screw on to one of the mandrels for using with corundum wheels made without metal centres.

The Lathe is neatly painted and gilded, and so beautifully modeled that it is quite an addition to the operating room, when it is desirable to use it in such a position. The Lathe is compact. The spindle

is so constructed that it can be taken apart and packed in a very small space, and is fitted with an appliance to take up any lost motion.

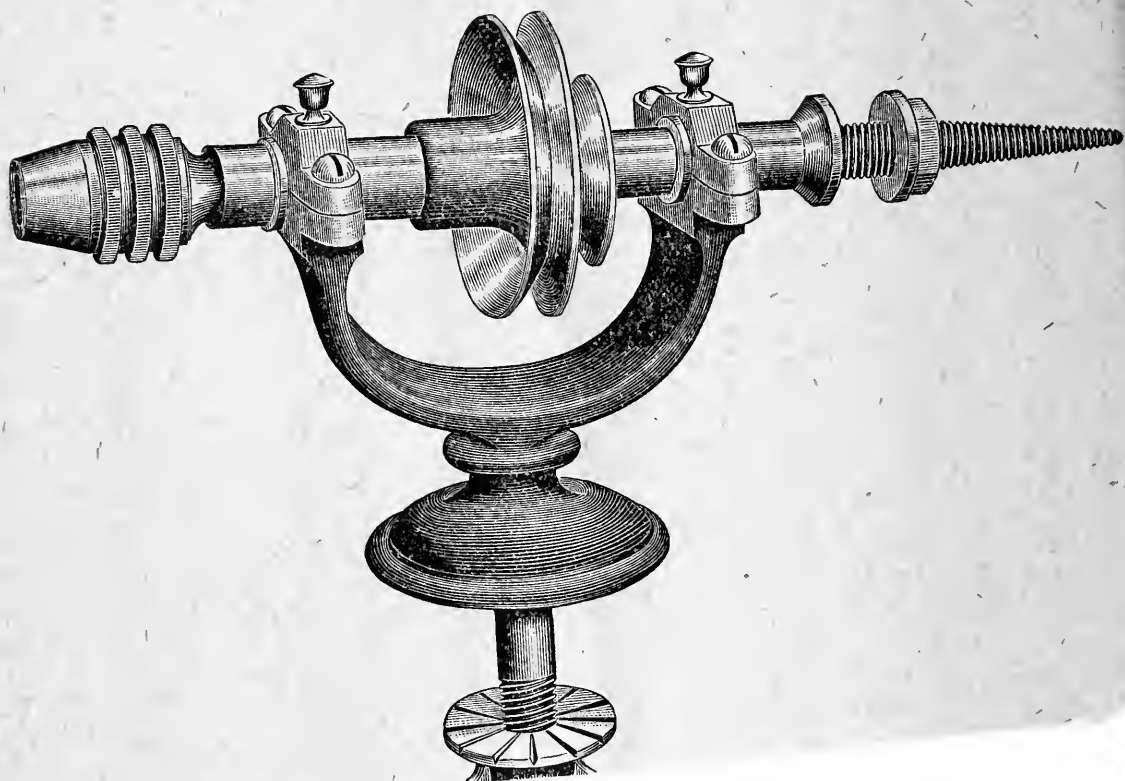
Price complete, with Mandrels and Chucks, boxed, \$17.

LATHE HEAD, No. 1.

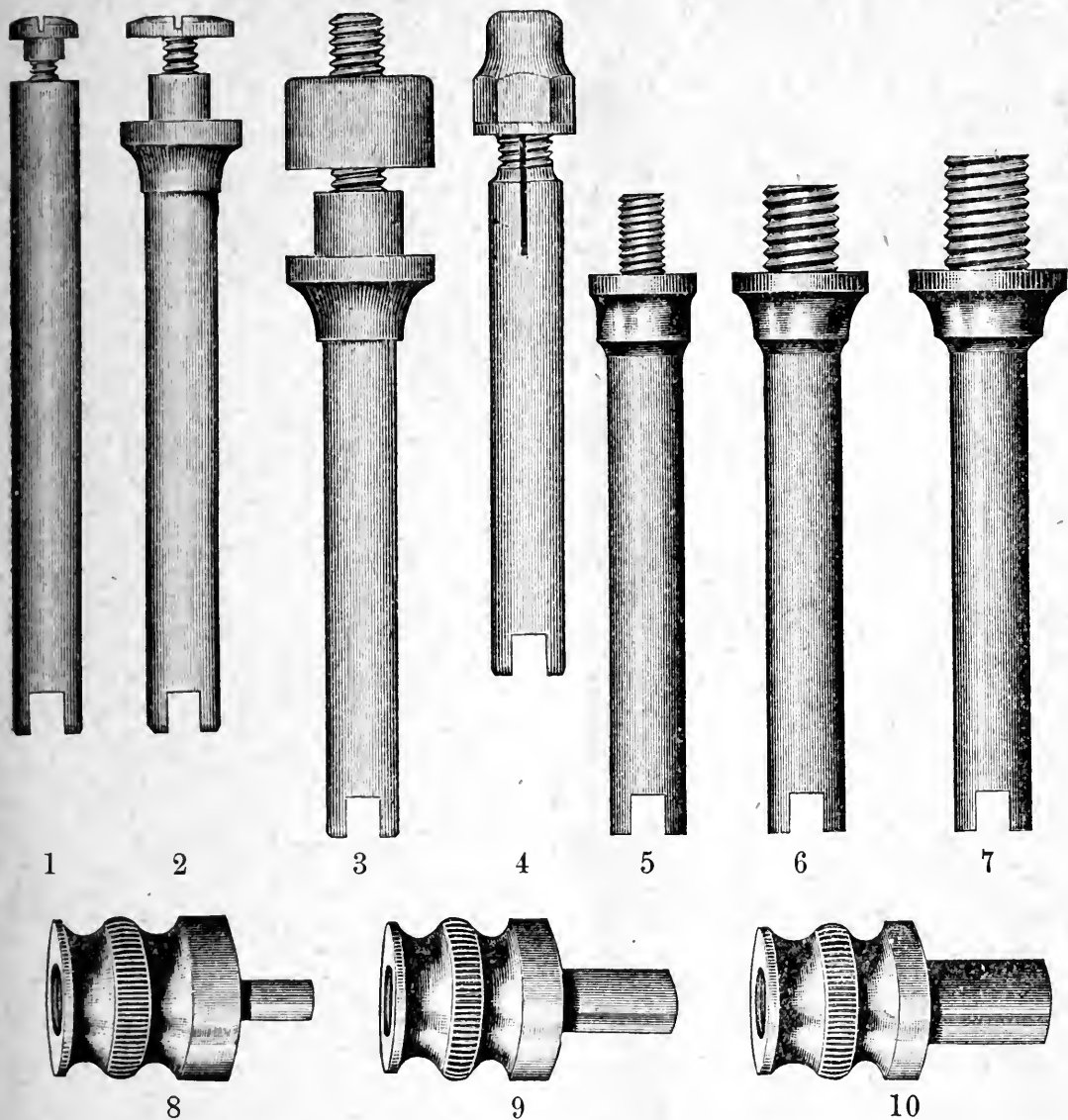


This Lathe Head is furnished with a split chuck and collar, which allow the mandrels to be changed with great facility, and insures their moving true; the other end of the spindle is made taper to carry brush wheels, felt wheels, &c. Accompanying the Head will be found three mandrels, fitted with screws and brass shoulders, one for each size of the threads, fitted in Johnson & Lund's Improved Metallic Centre Corundum Wheels. There are also three brass chucks, which screw on to one of the mandrels, for using corundum wheels made without metal centre. **PRICE COMPLETE, WITH MANDRELS AND CHUCKS, \$6 00**

LATHE HEAD, No. 4.



Chucks for Lathe Head No. 4.



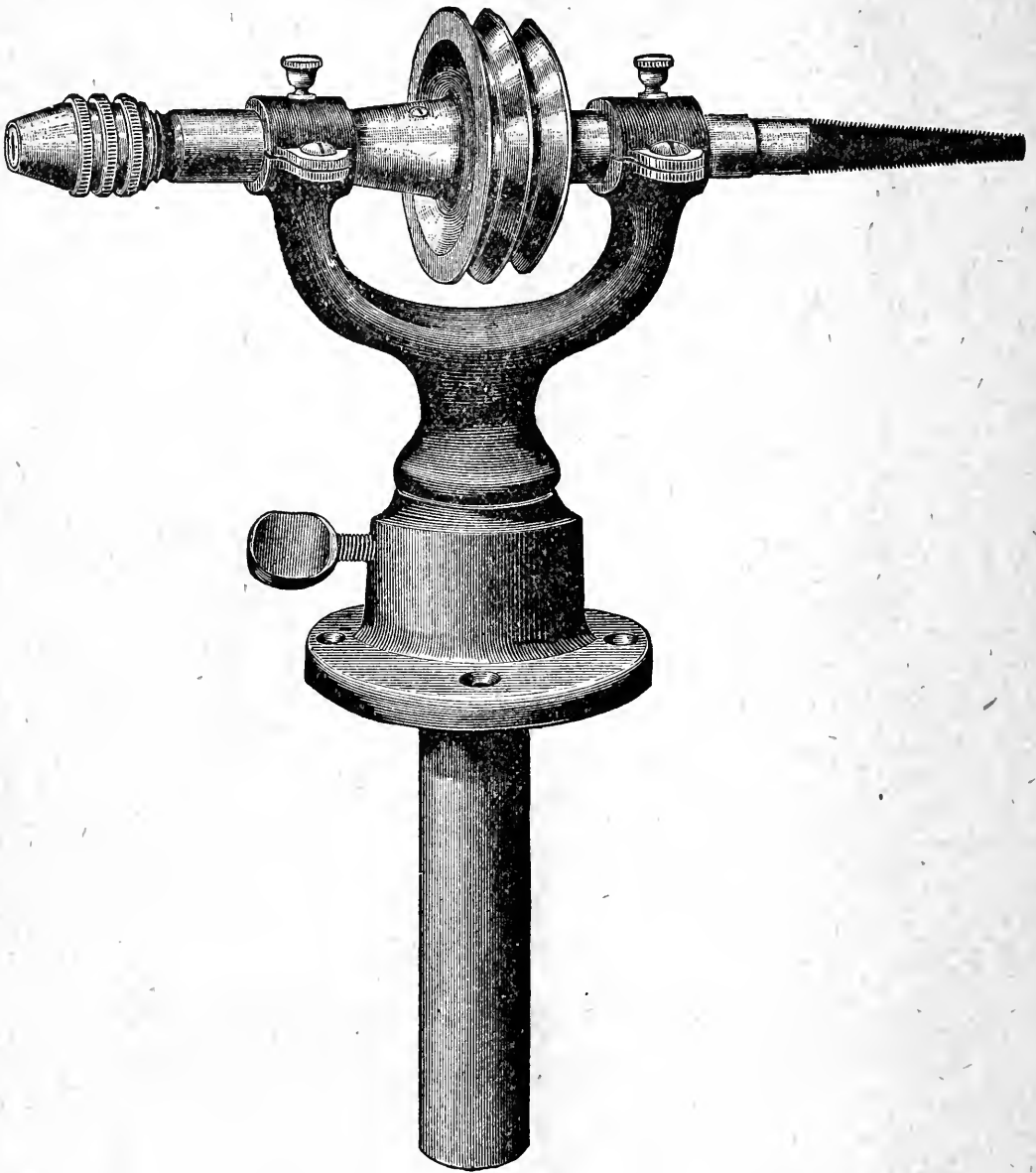
Nos. 1, 2 and 3 are screw chucks for corundum wheels, &c. No. 4 will carry engine burs, drills and tools. Nos. 5, 6 and 7 are screw mandrels for the improved metal-centre corundum wheels. Nos. 8, 9 and 10 are brass chucks fitting upon No. 7, and are intended for shel-lacking corundum wheels on.

PRICE:

Set of ten Chucks.....	No. 1.....	No. 2.....	No. 3.....	No. 4.....	No. 5.....	No. 6.....	No. 7.....	Nos. 8, 9, 10, each.....
\$4 00	\$ 30	45	60	1 00	35	40	45	25

A set of Chucks to accompany Improved Lathe No. 1. Lathe Head No. 1 and Socket Lathe Head, consists of Nos. 5, 6, 7, 8, 9, 10. Illustrated above.

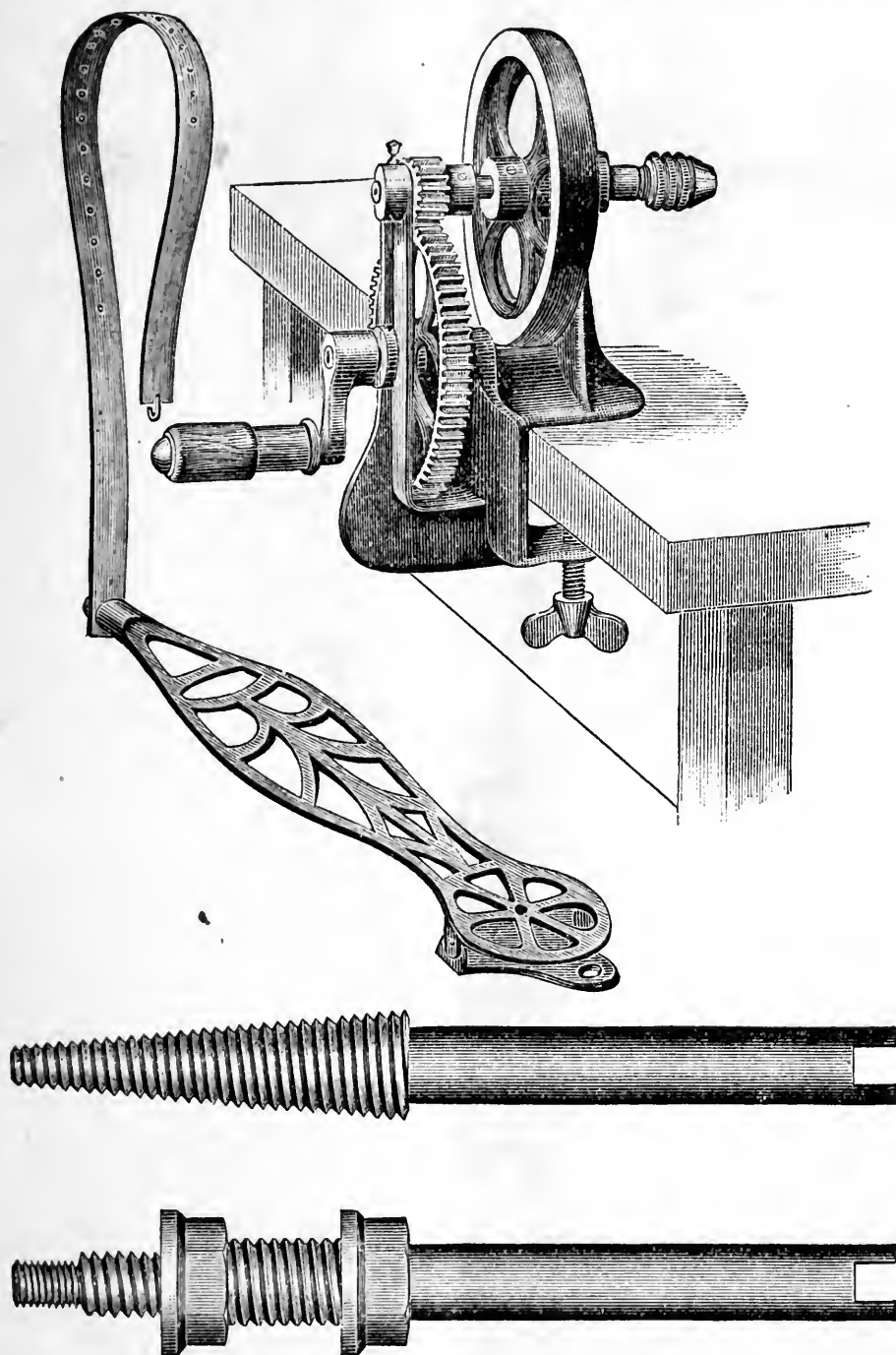
SOCKET LATHE HEAD.



This Lathe Head is so constructed that it can be raised or lowered $4\frac{1}{2}$ inches. This admits of its being made to suit the height of the operator, and also to tighten the cord, without removing it from the Lathe. This Lathe Head is furnished with a split chuck and collar, which admits of the mandrels being changed with great facility, and insures their running true. The other end of the spindle is made taper, to carry brush wheels, felt wheels, &c. Accompanying the Lathe will be found three mandrels, fitted with screws and brass shoulders, one for each size of the threads fitted in Johnson & Lund's corundum wheels. There are also three brass chucks which screw on to one of the mandrels for using corundum wheels made without metal centres.

Price complete, with Mandrels and Chucks.....\$7.00.

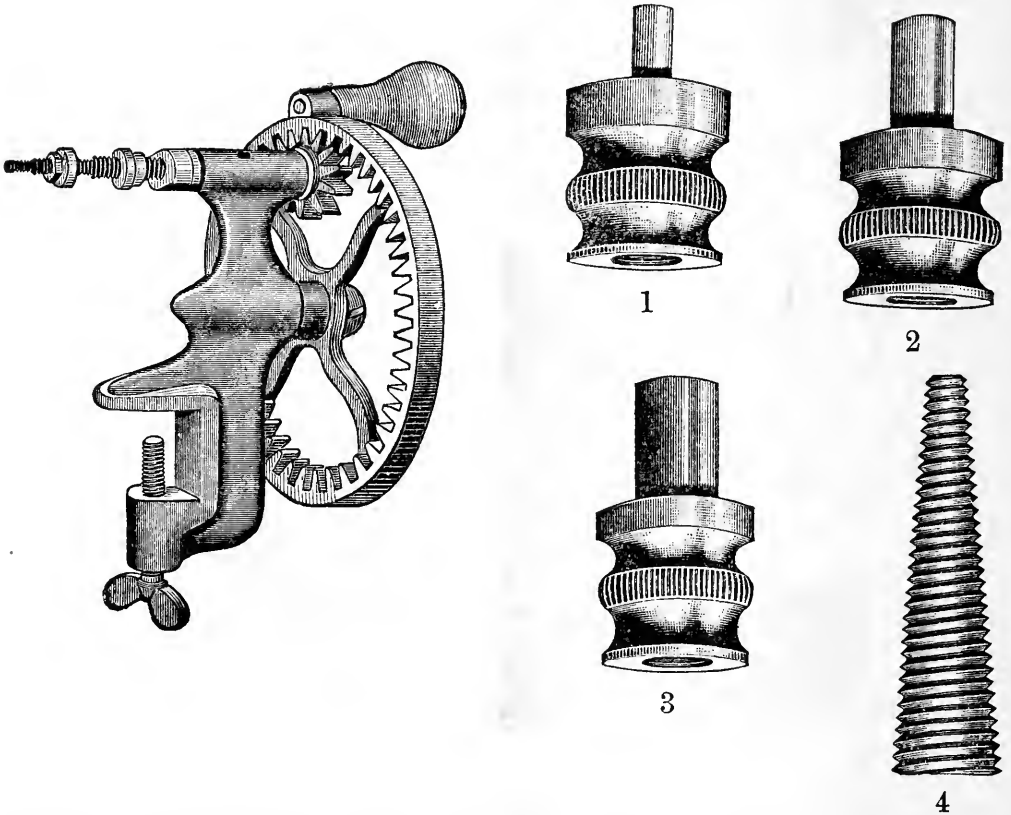
Hand and Foot Lathe.



The above cut illustrates our HAND AND FOOT LATHE. It is made with a Split Chuck similar to the one fitted to our Improved Dental Lathe and various Lathe Heads. It is furnished with a taper Mandrel for the accommodation of Brush Wheels, Felt Wheels, Cones, etc., and with a Universal Mandrel which will fit any size of Corundum Wheel, Cone or Cup, made with the Improved Brass Centre, from the very smallest to the largest and thickest sizes. We also send with the Lathe three brass Chucks, (not illustrated here), which screw upon the Universal Mandrel for the convenience of those preferring to use Corundum Wheels without the metallic centre. The Lathe weighs, with two Mandrels and three brass Chucks, complete, seven pounds and twelve ounces. The geared wheels are machine-cut, and the workmanship throughout is of the best description.

PRICE, COMPLETE.....\$6.50.

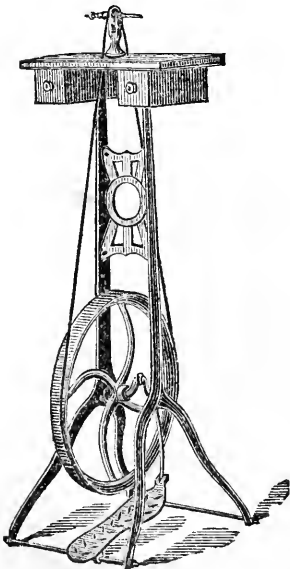
HAND LATHE, No. 5.



The above cut represents a portable Hand Lathe for dental purposes. It is well made and weighs only 2 lbs., making it valuable for a traveling outfit; the lathe is furnished at its shoulder with parting nuts for holding large wheels; and the mandrels are furnished with three different sized threads which will accommodate any size of the metal centre corundum wheels, cones, cups, etc. Corundum wheels, without the metallic centre can be used with the brass chucks furnished with the lathe; we also furnish a cone screw for brush felt wheels, etc.

PRICE:

No. 5 Hand Lathe and Chucks.....\$3.00.
Extra Chucks, each.....25 Cents.



A BARGAIN!

We offer for sale eight Upright Dental Lathes, perfectly new; Howe pattern; driving-wheel 17-inch diameter; iron frame; walnut table, with two drawers.

Price (not boxed,) each \$8.00.

Boxing, 75 cents extra.

JOHNSON & LUND,

620 RACE STREET, PHILADELPHIA.



Jan., '87

USE BUCK & CO.'S

EUREKA

CEMENT!

For producing a Perfect Joint in Gum Sections.

NO FAILURE!

NO OFFICE RIGHT TO BUY.

We could print over 100 testimonials that would speak in the highest praise of this CEMENT.

Dr. P. P. Nichols of SEARSPORT, ME., says:

"I like the Cement very much and could not be without it."

A Sample Package costs	-	-	-	-	-	-	25 cents.
A Large	"	"	-	-	-	-	\$1.00.

DOUCEHALEINE.

(CUT THE EXACT SIZE OF BOTTLES.)



SIZE NO. 1.

This Elegant Mouth Wash is composed of materials having the most beneficial effect upon the Gums, Teeth and Breath. It should be used every day, both in Cleansing the Teeth and in Rinsing the Mouth. Size No. 1 contains $3\frac{1}{2}$ ozs. of liquid. Size No. 2 contains $1\frac{1}{4}$ ozs. of liquid. The Metallic Tops are made of fine Britannia, and therefore retain their lustre much longer than those in general use. Directions for use accompany every bottle.

—o—

PRICES FILLED WITH

“ DOUCEHALEINE.”

	Per 1 doz.	Per 3 doz.	Per 6 doz.	Per 12 doz.
Size No. 1....	\$4.00....	\$10.80....	\$20.40....	\$38.40
Size No. 2....	2.00....	5.40....	10.20....	19.20
Pint Bottles, for office use, each.....	\$1.25			
Quart “ “ “	2.25			
Half-gal. Bottles, “ “	4.25			
One “ “ “ “	8.00			

Size No. 1 is put up in wooden boxes containing one-half dozen bottles. Size No. 2 is put up in wooden boxes containing one dozen bottles.

Prices of empty bottles fitted with Metallic Tops.

	Per 1 doz.	Per 3 doz.	Per 6 doz.	Per 12 doz.
Size No. 1.....	\$1.50.....	\$4.05.....	\$7.65.....	\$14.40
Size No. 2.....	1.25.....	3.38.....	6.37.....	12.00

ODONTOPHILE.

(CUT EXACT SIZE OF BOTTLE.)



ODONTOPHILE.

This Elegant Denti-frice is put up in bottles made of the best flint glass and having wide mouths they are readily filled. They are fitted with tightly-fitting corks, mounted with screw tops made of fine Britannia metal, effectually preventing the escape of the perfume, or the spilling and wasting of the tooth-powder during transportation in the traveler's trunk or otherwise. They are panelled on three sides, the fourth being flat to receive a proper label. Several persons can use from the same bottle with propriety, if desirable. These bottles are shaped so as to afford the contents free delivery.

No. 1.

PRICES FILLED WITH "ODONTOPHILE."

		Per dozen.	Per 3 dozen.	Per 6 dozen.	Per gross.	Each
BOTTLES	No. 1.	\$4.00.	\$10.80.	\$10.40.	\$38.40.	\$ 0.35
"	No. 2	3.00.	8.10.	15.30.	28.80.	.30
"	No. 3.	2.00.	5.40.	10.20.	19.20.	.20
		Per can.		Per 6 cans.	Per 12 cans.	
	1-pound can.	\$1.50.		\$ 8.10.	\$15.30	
	2 " "	2 75.		14.85.	26.40	
	4 " "	5 00.		24.00.	45.00	
	1/2 " "	.90.		4.86.	9 18	
	1/4 " "	.50.		2.70.	5.10	

PRICES EMPTY.

		Per dozen.	Per 3 dozen.	Per 6 dozen.	Per Gross.	Each
TOOTH POWDER BOTTLES,	No. 1.	\$1.50.	\$4.05.	\$7.65.	\$14.40.	\$0.15
"	No. 2.	1.25.	3.38.	6.37.	12.00.	.12
"	No. 3.	1.10.	2.97.	5.61.	10.56.	.10

NEW!



NEW!

ENTIRELY NEW!

JAPANESE PELLETS,

OUR OWN DIRECT IMPORTATION.

(For absorbing Moisture in the Mouth.)

Made in Japan from the Finest Quality

JAPANESE BIBULOUS PAPER,

PUT UP IN BOXES CONTAINING 1000 PELLETS EACH, ASSORTED SIZES.

These Pellets will be found exceedingly convenient to handle
as they are always ready for use.

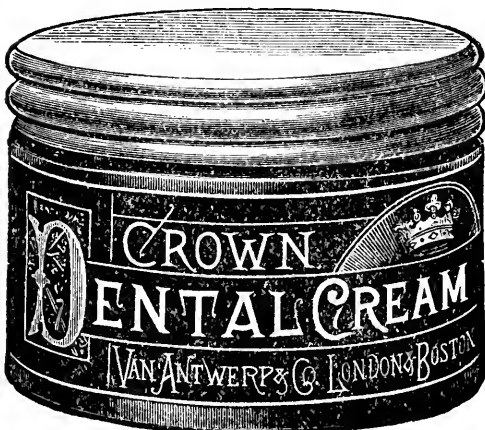
Price per box, containing 1000 Pellets, - - - 75 Cents.

SENT POSTAGE FREE UPON RECEIPT OF PRICE.

The Standard English Preparation for the Teeth.

VAN ANTWERP & CO.

CROWN DENTAL CREAM.



CROWN DENTAL CREAM, in a neat and compact form, combines all the purest essential ingredients for a perfect dentifrice; a cream, paste, powder and mouth wash in one. It removes all tartarous adhesions; arrests decay; induces a healthy condition of the gums; is pleasant to the taste and sweetens the breath. Prepared with honey and glycerine, the cream is always moist and may readily be taken up on the end of the brush. It is effectual, convenient, economical.

For sale by Druggists, Dentists and Dealers in Toilet Articles.

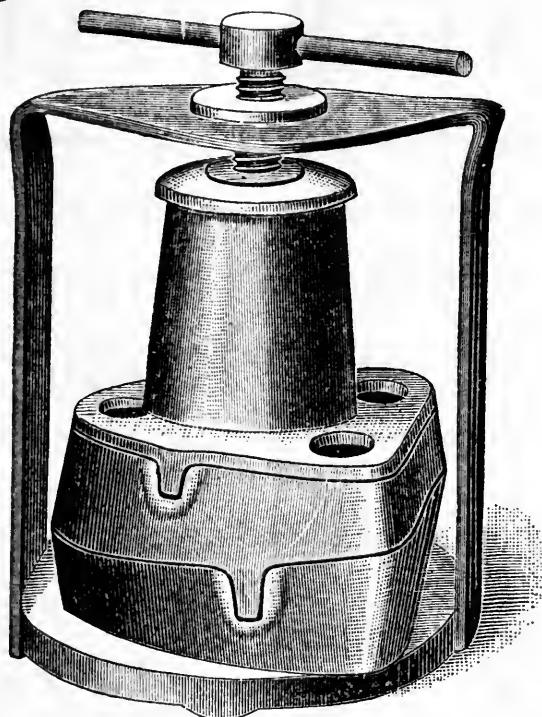
(Trade Mark registered, U. S. Patent Office.)

VAN ANTWERP & CO.

DEPOTS: NEW YORK, CHICAGO, BOSTON.

Price, per dozen, - - - - - \$2.00

G. E. DONHAM'S Spring Pressure for Flasks.



No Dentist can afford to get along without it.

The advantages of spring pressure over rigid pressure are obvious in many respects. It saves time in packing, does away with the bolts which are continually getting out of repair, avoids the liability of displacing and breaking blocks, and insures the dentist that his flask is together in the vulcanizer, as the pressure is retained on the flask while the rubber is in its most plastic state.

By using good judgment in the amount of rubber required, the necessity of opening the flasks is obviated.

The springs are adjusted to Whitney's vulcanizers and can be used in nearly all other vulcanizers now in use, and are of three sizes, to suit the different sized vulcanizers, holding one, two or three flasks, as the case may be.

DIRECTIONS FOR USE.

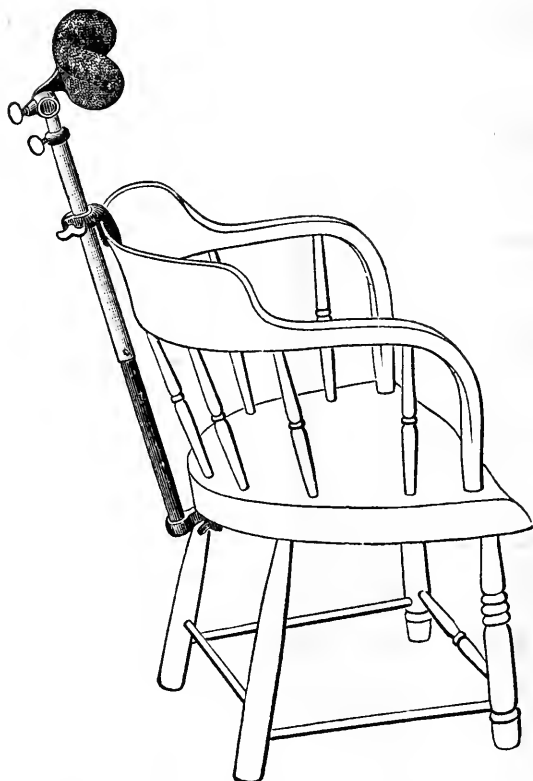
Cut channels for the escape of surplus rubber ; heat up the part of the flask containing the teeth hot enough to make the rubber flow easily under the pressure of the spring ; lay in rubber enough to make the plate, put the flask together in the spring, turn down the screw ; if the flask comes together so easily that you are in doubt about having enough rubber, you must open the flask and put in more ; then replace it in the spring ; turn down the screw and put in the vulcanizer without any care about the flask coming entirely together, the spring will take care of that.

Price of two or three flask Springs, each	-	-	-	-	\$1.25
Price of Flasks, each	-	-	-	-	1.00

Thousands of these springs have been sold, and I have yet to learn of the dentist that gave them a fair trial and then discarded them.

G. E. DONHAM, Rockland, Mass.

PORTABLE HEAD-REST.



This Head Rest can be attached to any chair, is very firm and can be raised, lowered or moved backward or forward without interfering with the attachment to the chair. It occupies a space only 13x4 inches, and weighs less than four pounds.

Price, \$5.00.



DALY'S CHEMICALLY PURE GOLD LINING.

Rubber Sore Mouth Cured and Prevented,

EACH BOOK CONTAINS 8 SQUARE INCHES OF GOLD LINING.

OLD RUBBER PLATES LINED.

Every Part of New or Old Plates can be Lined with It.

This lining presents advantages that no other can. It is formed entirely of chemically pure gold. It is united mechanically with the rubber of the plate without the intervention of any other metal or of rubber or any other cement between it and the plate.

Being so formed and so united there can be no tarnish or chemical change of state from the action of the secretion of the mouth, or from the effects of galvanic action between different metals in contact. Its union with the rubber is so perfect that it cannot be separated from it, and its removal involves the destruction both of the lining and the portion of rubber with which it is in contact.

Every surface of the plate can be lined with it if so desired. Old plates, no matter how long worn, can be lined with it, preserving perfectly the fit and articulation. Being formed entirely of pure gold, it will not only prevent rubber sore mouth, but will cure that disease where applied to rubber plates that have produced it.

The cost of lining plates with it will be seen to be small by taking the price of a book or it and counting how many plates of different sizes can be covered by eight square inches of lining, the amount contained in each book.

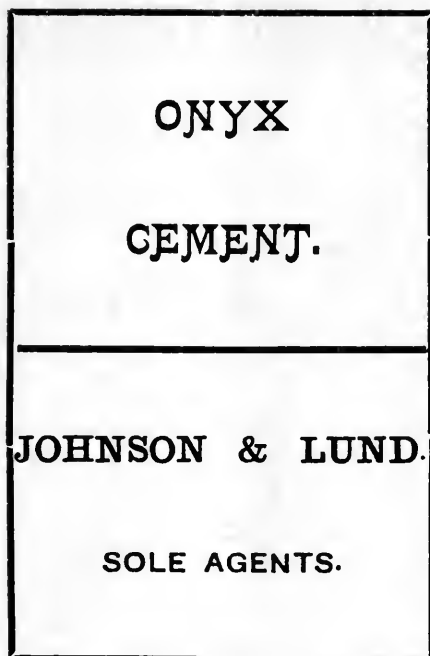
Full Instructions with Each Book.

PRICE, PER BOOK, \$3 50

The following named dentists in Baltimore and Washington made arrangements as published in the *Baltimore Sun* of January 5th, 1886, to use this lining:

BALTIMORE — Doctors T. S. Waters, W. H. Hoopes, W. B. Finney, C. E. Duck, T. H. Divy, S. C. Pennington, J. C. Uhler, O. F. McDonald, B. M. Wilkerson, J. B. McPherson, B. Holly Smith, C. E. Blewower, W. S. Norris, A. P. Krouse, J. A. Webb, A. G. Finney, E. P. Keech, M. W. Foster, A. P. Gore, T. W. Coyle, T. F. Cherry, W. P. Welsh, H. G. Ulrich, Bernhard Myer, T. F. Lang, A. J. Brown, A. J. Volck, H. E. Hardey, C. S. Grindall, W. A. Mills, J. H. Parker, L. J. Pearce, J. E. Orrison.

WASHINGTON.—Doctors James B. Hodgkin, L. C. F. Hugo, H. M. Schooley, Wm. Merrill, D. O. Knight, Thos. O. Hills, M. F. Finley, R. N. Gunnell, S. B. Muncaster, J. B. Ten Eyck, S. F. Newton, Geo. B. Welch, John L. Wolf, E. R. Rust, R. Finley Hunt, W. Donnally, H. B. Noble, E. B. Bliss.



ONYX CEMENT!

A PHOSPHATE OF ZINC.

It is the strongest, most dense, and in all respects possesses greater uniformity in all the essentials of a First-Class Filling than any other offered to the profession.

PUT UP IN PACKAGES CONTAINING $\frac{1}{2}$ OUNCE.

Price per package, - - - - - \$1.00.

Each package of the "Onyx" Cement will contain a small piece of the "Asbestos Felt." so that the operator may have an opportunity of testing its value.

PHOSPHATE OF ZINC.

PREPARED BY DR. C. N. PEIRCE.

The packages for the next four months will contain a small piece of ASBESTOS FELT, so that those desiring may have the opportunity of testing its value as a lining for cavities, and as a nerve cap.

Price per package, - - - - - \$2.00.

JAPANESE BIBULOUS PAPER.

Reduction in Price.

OUR OWN IMPORTATION.

We are just in receipt of a large invoice of Japanese Bibulous paper direct from Yokohama. By importing this absorbent directly from Japan, we save the profits which we have heretofore been obliged to pay to the importers which enables us to have the pleasure of announcing to the profession a further reduction in price.

Price per 100 sheets, - - - - - \$ 40
 " 500 " - - - - - 1 75

POSSESSES THE GREATEST FREEDOM FROM SHRINKAGE.

IT RETAINS ITS BRIGHTNESS.



oz. Troy.
**EXTRA TOUGH
GOLD
AND
PLATINA ALLOY**

A notable Tooth Saver.

The proportions of Gold and Platina in this Alloy with the Combination of Silver, Tin, &c., cause it to harden quickly and to maintain its edge strength. Use as little Mercury as will make a stiff plastic filling, and place in cavity without washing.

JOHNSON & LUND,

SOLE AGENTS,

620 Race St., Philada.

514 Wabash Ave., Chicago.

WORKS WITH GREAT PLASTICITY AND PACKS DENSELY.

IMPERVIOUS to the SECRETIONS of the MOUTH.

PRICES.

Per ounce	\$ 3 00
" half ounce.....	1 50
" two ounces purchased at one time	5 40
" three " " "	7 65
" four " " "	9 76
" five " " "	11 75
" ten " " "	20 00

When money accompanies the order, the Amalgam will be sent postage free.

Virgin White Alloy for Front Teeth.



The prominent qualities of this Alloy are its WHITENESS and FREEDOM FROM SHRINKAGE. Fillings made of this Amalgam, in tubes five or six times the diameter of those usually employed in the "leakage test" with blue or purple ink, give no perceptible indications of permeation of fluid. Though designed especially for front teeth, yet it will stand mastication well anywhere in the mouth. For crown cavities, however, we recommend the EXTRA TOUGH GOLD AND PLATINA ALLOY, as that is made with especial regard to edge strength.

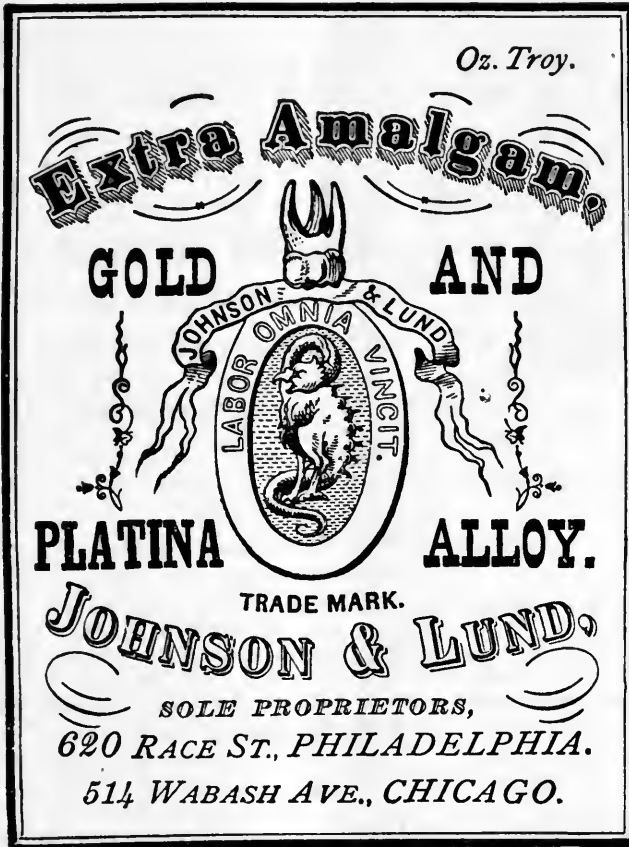
PRICES.

Per ounce.....	\$2 00
" half ounce	1 00
" two ounces purchased at one time	3 80
" three " " "	5 40
" four " " "	6 80
" five " " "	8 00
" ten " " "	15 00

When money accompanies the order, the Amalgam will be sent postage free.

It Retains its Brightness.

It works with great Plasticity, and packs densely.



It possesses the greatest possible freedom from shrinkage.

Impervious to the Secretions of the Mouth.

PRICES.

One	Ounce Package	.....	\$3 00
Two-thirds	" "	.....	2 00
One-third	" "	.....	1 00
Two ounces,	purchased at one time	.....	5 40
Three	" " " "	.....	7 65
Four	" " " "	.....	9 75
Five	" " " "	.....	11 75
Ten	" " " "	.....	20 00

When money accompanies the order, the Amalgam will be sent postage free.

IMPERIAL VARNISH.

FOR VARNISHING PLASTER IMPRESSIONS AND FOR
GENERAL LABORATORY USE.

No oil, soap or coloring material needed with this Varnish,
as it takes the place of all.

Prepared by S. ELDRED GILBERT, D. D. S.

Put up in wide-mouthed two ounce bottles.

Price per bottle, 25 Cents.

Continuous Gum-Work Made Easy !

DR. TEES' LILIPUT FURNACE

For Continuous Gum-Work.

This furnace is the result of experiment on the part of Dr. Tees, to get the requisite amount of heat, with the expenditure of the least amount of fuel, Although fifteen inches high, twelve inches wide, and eight inches deep, yet the heat of the muffle is intense enough to fuse the enamel of the teeth again, after being *etched*; and, excepting the hottest days of summer, the laboratory will not be uncomfortably warm.

With the Liliput Furnace, with the proper and convenient appurtenances accompanying it, with one kind and size of fuel, and with the management of the Furnace heats, heretofore considered the most difficult part of the work, reduced to a clock-work system, a novice, by careful attention to the directions and instructions, may be successful with his first set of Continuous Gum.

Instructions in pamphlet form, for "Dr. Tees' Simplified System of Mounting and Mending Continuous Gum-Work," accompany each Furnace.

With the Furnace are two muffles, one ash-pan, one slide, a poker, a pair of tongs, two coke-screens, and one-half pound of kaolin.

Price of Furnace, with necessities as above, \$30.

Boxing, \$1 extra ; extra muffles, 75 cts. each.

Body	\$1 50	per 1 oz
Light Colored Gum Enamel	1 25	per $\frac{1}{2}$ oz
Medium Colored Gum Enamel	1 25	per $\frac{1}{2}$ oz
Dark Colored Gum Enamel	1 25	per $\frac{1}{2}$ oz

Ambler Tees, D. D. S.

548 NORTH SEVENTEENTH STREET, PHILADELPHIA.

CHAS. ABBEY & SONS,
DENTISTS' FINE GOLD FOIL.

SOFT, OR NON-ADHESIVE, AND ADHESIVE.

ALL FROM ABSOLUTELY PURE GOLD.



230 Pear Street, Philadelphia.

Jan. 87.

THE Improved Taylor Automatic Plugger



We present this instrument in a GREATLY IMPROVED condition, and ask especial attention to its extreme simplicity. With proper usage it is impossible for it to get out of order. The force of the blow can be readily altered by turning the cap to right or left, and by screwing it all the way down the mallet can be used for hard pressure.

These instruments are furnished in the best manner, and handsomely nickle-plated. They carry the Snow and Lewis points.

PRICES.

The Taylor Mallet, Plain, Polished Barrel, Nickle-Plated	each, \$7 00
The Taylor Mallet, Knurled Barrel, Nickle- Plated	each, \$7 50
The Taylor Mallet, Knurled Barrel and Nose- Piece, Nickle-Plated	each, \$8 00
Points to Fit (ordinary)	per doz., \$3 00

JOHNSON & LUND, Sole Agents.

620 Race St., Philadelphia. 514 Wabash Ave., Chicago.

PROF. C. N. PIERCE, says.—“The Taylor Automatic Mallet serves me nicely ; think it equal to any other instrument of its kind.”

PROF. GORGAS, of Baltimore, says: “I have used the Taylor Automatic Mallet with great satisfaction.”

JAMES M. ERNEST,

MANUFACTURER OF

Dentists' Files

OF ALL DESCRIPTIONS,

2121 SARGEANT ST.,

PHILADELPHIA, PA.

Oct. 1887.

DENTISTS' POCKET DIARY

—AND—

APPOINTMENT BOOK.

For Registering Appointments.

THURSDAY.

188

8		1	
9		2	
10		3	
11		4	
12		5	

FRIDAY.

8		1	
9		2	
10		3	
11		4	
12		5	

We show above the precise size and fashion of two-thirds of a page of the Appointment Book. It contains blanks for fifty-four weeks; three days being provided upon each page, so that when the book is open, it presents engagements for one week. The figures denote the hour of the engagement; being without date it is good for any time—It also contains a neat memorandum in the back part.

PRICES.

Flexible Cloth Covers, red edge, each.....	.60
“ Morocco “ “ “ “ .....	.75
“ “ “ gold “ “ .....	.75
“ “ “ “ “ “ with pocket and tuck.....	\$1.00

PINK WAX.

IN LONG THIN SHEETS, FOR BASE PLATES. *EXCEEDINGLY TOUGH.*

Put up in 1-2 pound boxes.

Price per pound.....\$1 25
 " " half pound..... 63

PINK WAX.

IN THIN SHEETS, FOR BASE PLATES. *CUT TO PATTERN.*

Put up in 1-2 pound boxes. 48 forms in each box.

Price per pound.....\$1 40
 " " half pound..... 70

KNOXVILLE DENTAL DEPOT

No. 11 Asylum Street, Knoxville, Tennessee.

Where May be Found a Complete Assortment of Dental Supplies.

I keep all Dental Goods and Instruments

Made and Handled by

JOHNSON & LUND,

M. M. HARRIS, Proprietor.

B. L. KNAPP & CO.,

161 TREMONT STREET, BOSTON, MASS.

Have Constantly on Hand a Large Stock of Johnson & Lund's IMPROVED
 ARTIFICIAL TEETH, EXTRA TOUGH RUBBER, EXTRA AMAL-
 GAM, ONYX CEMENT, LATHES, VULCANIZERS,
 IMPRESSION CUPS, &c., &c.

Give them a call, and you will receive a prompt and satisfactory response.

A. W. SEE & CO.

1288 BROADWAY, NEW YORK.

BRANCH DEPOT:

374 Fulton St., Brooklyn, N. Y.

Dealers in JOHNSON & LUND'S Im-
 proved Artificial Teeth, Extra Tough
 Rubber, Crimson-Brown Rubber, Light
 and Dark Red Rubber, Extra Amalgam,
 Onyx Cement, Johnson & Lund's Lathes,
 Johnson & Lund's Vulcanizers, Impression
 Cups, and a full line of Dental Goods
 generally.

Dentists will do well to call upon them
 before purchasing elsewhere.

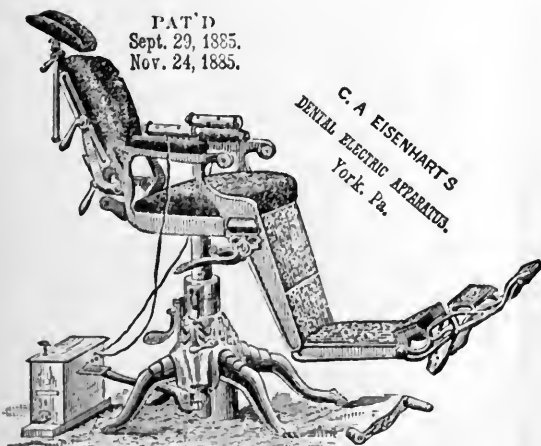
AN ULTIMATE TRIUMPH.

Teeth extracted by Elec-
 tricity, and sensitive cavities
 excavated with ease. Best
 recommendations furnished on
 application to

Dr. C. A. Eisenhart,

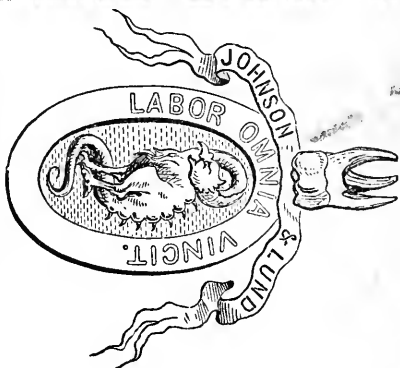
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THE

Dental Office and Laboratory.

THIRD SERIES.

VOL. I.

PHILADELPHIA, MARCH, 1887.

No. 2.

VULCANITE WORK.

ATTACHING THE MODELS TO THE ARTICULATOR—BY DR. THEO. F. CHUPEIN.

(Continued from page 9.)

WHEN the models are to be fastened to the articulator, the pin which serves as a pivot to hold the two parts of the articulator is removed. The base plate is removed from the upper model, and this, as well as the lower model, is placed in a bowl of water. The upper part of the articulator is now laid on a slab of glass or on a piece of paper on a table, and some plaster is mixed with water and a little salt. This is now put, with a spoon or spatula, on that part of the articulator designed to hold the upper model, and the upper model is removed from the water and placed in proper line and position into this plaster. When this has set so as to hold the model to this part of the articulator, the wax base plate is put on the model; more plaster is mixed with salt and water as before, and the lower model is placed in position on the articulating wax. The pin is now inserted so as to connect the two parts of the articulator together, and the lower model is fastened to the lower part of the articulator with the plaster mixed for this purpose. The reason why salt is advised to be used with the water when mixing the plaster to secure the models to the articulator, is because the plaster does not get so very hard with it as when it is not used, and thus the labor of cutting the model from the articulator when the case is ready to be flaked is considerably reduced. Before closing this subject of "the bite" we will enter a word of caution and protest of a manner of conducting this operation by some operators. Some will not go to the trouble of making a lower model as has been described, but will rely on the slight indentation left by the lower teeth on the articulating wax, which, as a guide in arranging the teeth for the upper denture, is almost useless; others will take a lump of wax and bend it, while soft, in the form of a horse-shoe, introduce this into the mouth and let the patient bite into it. This is a most careless, unreliable and unsatisfactory method of taking "the bite."

In the manipulations we have thus far described the idea has been to teach how an upper denture is to be constructed, when the base is to be of vulcanite or celluloid, the manipulations for the latter being the same in all particulars up to the time of flasking.

We have now learned how to take an impression in wax, modelling composition and plaster of Paris; how to make the model, how to take the bite, and how to secure the models in the articulator. Our next effort will be to describe the

MOUNTING OF THE TEETH.

The color, size and shape of the teeth having been decided on and selected, preparations are now made to attach these to the base plate. Before this is begun, however, it is well to secure the air chamber in position on the model, as well as to lift or raise the hard parts on the model, so that when the plate is vulcanized it will not press on these, which are unyielding. It has been suggested and advised that, on taking a plaster impression, that these parts be examined, and that the *hard places* in the mouth be traced, as nearly as possible, with a lead pencil, correspondingly *in the impression*, and before the model is made that these places, thus lined out, be scraped or cut away, so that when the model is made this scraping will lift or raise the plate that is moulded on the model, so as not to bring too great pressure at these unyielding points. In like manner, when the model is made, this is to be scraped or cut at the *soft places*, so as to induce pressure of the plate at these points. While there is reason in these suggestions, we fear that there is no certainty in these scraping operations, as we cannot tell for certain how much or how little we have scraped from impression and model. We will suggest a plan which will effect the same object with more certainty. The depots all sell thick tin-foil, which comes in long rolls and may be purchased by the ounce or pound at a nominal cost. It has been our practice to make a fold of one, two or four thicknesses of this (according to the hardness or rigidity of the spot on the gum), and mould it nicely and evenly on the model, and with a pair of small scissors cut out to pattern this fold of tinfoil according to the shape traced in lead pencil on the model. When this is done it is pinned down to the model with the heads of (small) ladies' dressing pins, so as to keep it in place. We do not meddle with the soft places, but simply raise the hard places as described. This being done, the central air chamber is next made. For this purpose we take a piece of stiff brown paper and fold it on itself, and then trace on one side half the shape of the proposed air chamber. Fig. 9 illustrates this. The pattern thus traced, is cut



FIG. 9.



FIG. 10.

out with a pair of scissors, which will be perfectly symmetrical.

The advantage of this is that any shape desirable for the air chamber may be given. The pattern of the air chamber being thus secured, it is laid on a piece of pure tin plate, about No. 18 thickness of the plate, and wire gauge, Fig. 11, and its shape traced with the



FIG. 11.

sharp points of an instrument. It is then cut out with scissors, and three holes punched through it with the plate punch. Fig. 12.

It is laid on the palatine surface of the model in the position it is to occupy, when the three holes are countersunk with a round bur about the size of No. 6 (Fig. 13).

The chamber pattern thus prepared is shown at Fig. 14.

The chamber pattern is now secured to the model with the heads of small pins. This being done, a groove is cut all around the chamber pattern with a small instrument scratching into the model to the depth of the thirty-second of an inch. In forming the air chamber it is better that this should be *large and shallow* than *small and deep*. Fig. 15 represents the model thus prepared.

These preliminaries being completed, we replace the base plate by softening it slightly, so that it will go over the air chamber which has been added to the model.

If gum section or block teeth are to be used, they are fitted to the base plate by dressing away a portion of the articulating wax until they antagonize properly with the lower teeth. The sides of the blocks should be ground and fitted to each other with great accuracy and nicety, so that the eye may not be able to detect the joint, so as

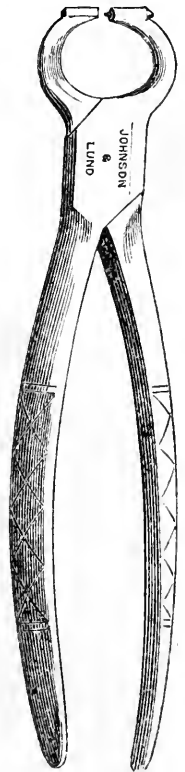


FIG. 12.

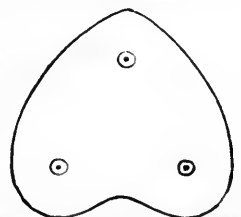


FIG. 14.

to prevent the vulcanite from oozing through, and thus making an unsightly division between the blocks. This is done with a grind-

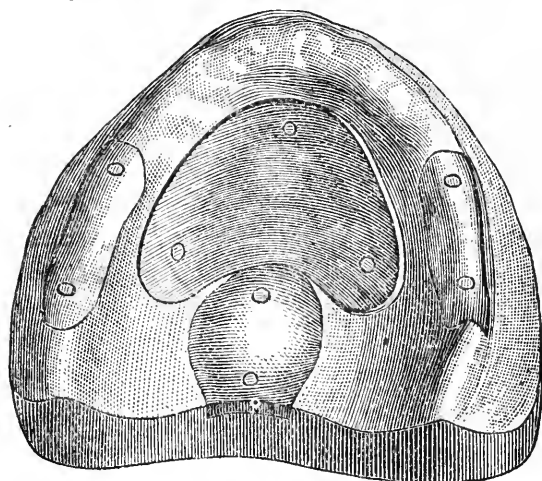


FIG. 15.

Model prepared with raised places of thick tinfoil at the hard parts, and air chamber secured in position.

upper front teeth should not be permitted to strike or touch the six lower front teeth, but should be kept apart about the thickness of

stone, as illustrated at Fig. 16, on the polishing lathe Fig. 17. The upper teeth should overlap the lower slightly, but should there be a protrusion of the lower jaw they may be mounted so as to be brought together, edge to edge. The bicuspid blocks should stand slightly inward, and the cusps of these, particularly the outer or buccal cusps, should be ground down so as to accommodate the lateral motion of the jaws. In arranging the teeth on the base plate, the six

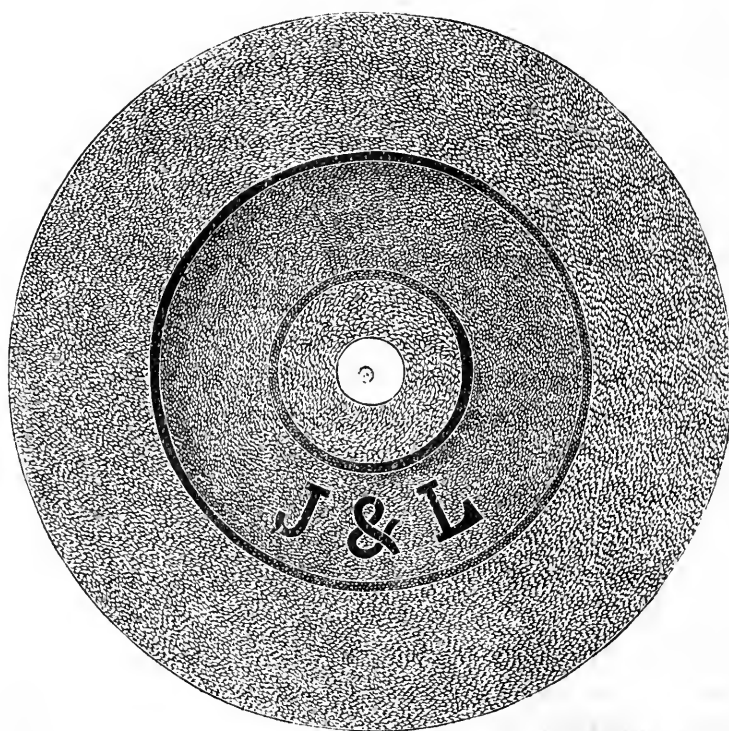


FIG. 16.



cardboard. The bicuspids and molars only should be permitted to strike against the lower teeth. All the teeth being affixed to the plate, they should be tried in the mouth to see if they articulate

properly, if the general expression is pleasing and natural, if the teeth are long enough or too short, if they show too much or too little, if the lips sink or are puffed or full. All these corrections being made,

the case is replaced on the model in the articulator, and it is waxed up. This waxing is facilitated with the wax Knife or spatula (Fig. 6 of these papers). A rim of wax is put around the front and above the edges of the blocks this rim should be slightly in excess of what it is intended to be, to allow for filing smooth and finishing. All superfluous wax from the inner or palatal surface is scraped off with the heated wax spatula, and all inequalities made even. The wax is made smooth by the means of short, quick and sudden blasts from a mouth blowpipe directed through the flame of a spirit lamp. This being accomplished, the model with the teeth mounted in

wax on it, is removed from the articulator. This is best done by placing all in a basin of water. The water partly softens the plaster,

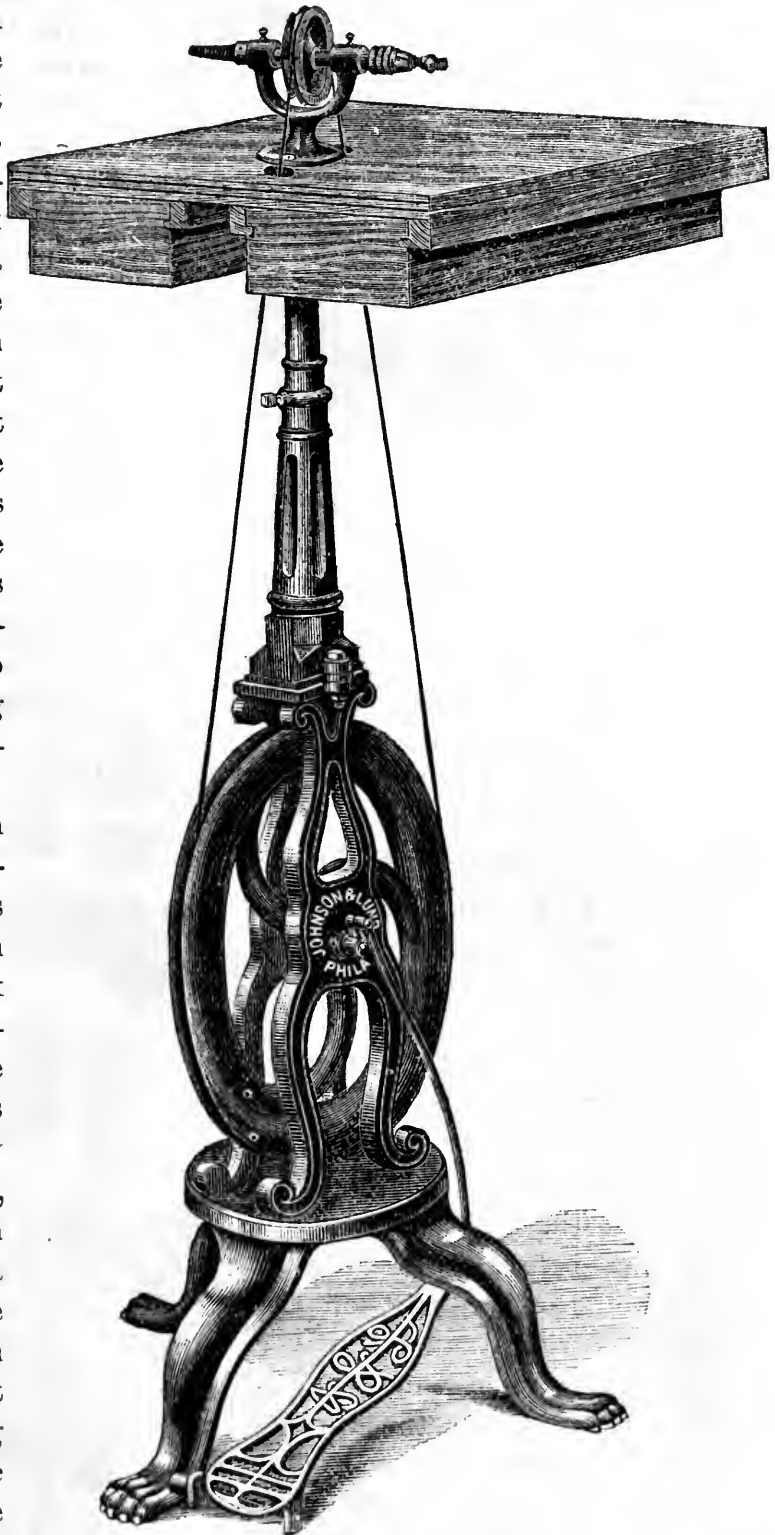


FIG. 17.

particularly that which was mixed with salt to attach the models to the articulator. It may then be cut away from the articulator and trimmed ready for flasking.

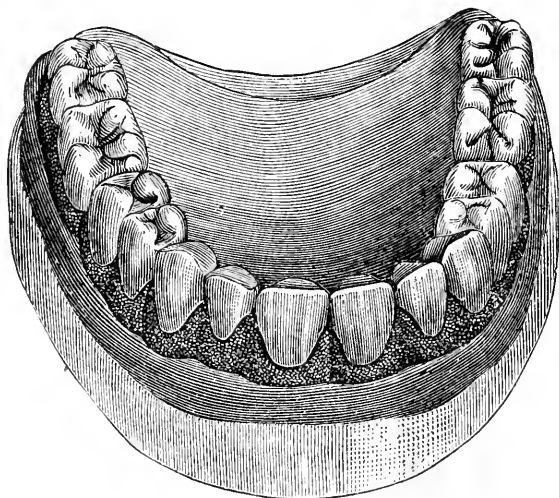


FIG. 18.

The teeth mounted in wax as has been described are shown in Fig. 18.

FLASKING.

This operation is accomplished as follows: Plaster is mixed in a bowl with salt and water, and a part of it is conveyed with a spoon or spatula into the lower part of the flask. Fig. 19.

The model, which had been allowed to soak in water while the plaster was being prepared, is now pressed into this part of the flask until the plaster rises all around to the edge of the wax rim and along the back or posterior part of the wax plate. This is aided or better effected with the blade of a knife so as to halve the case in this part of the flask. The plaster set, it is smoothly trimmed, and varnished with shellac varnish. The flasking of the case so far accomplished is represented in Fig. 20.

The varnished part of the plaster is now oiled and the ring placed on the lower part of the flask. See cut (No. 19) containing the teeth. Plaster is again mixed, as before with salt and water, and the entire of the flask filled with it, and the cover is put on. When thus far advanced the case has the appearance represented by Fig. 21.

The plaster in the flask being set hard, the flask is warmed sufficiently to slightly soften the wax, when the two halves of the flask are separated—the wax and teeth adhering to the upper half—the model

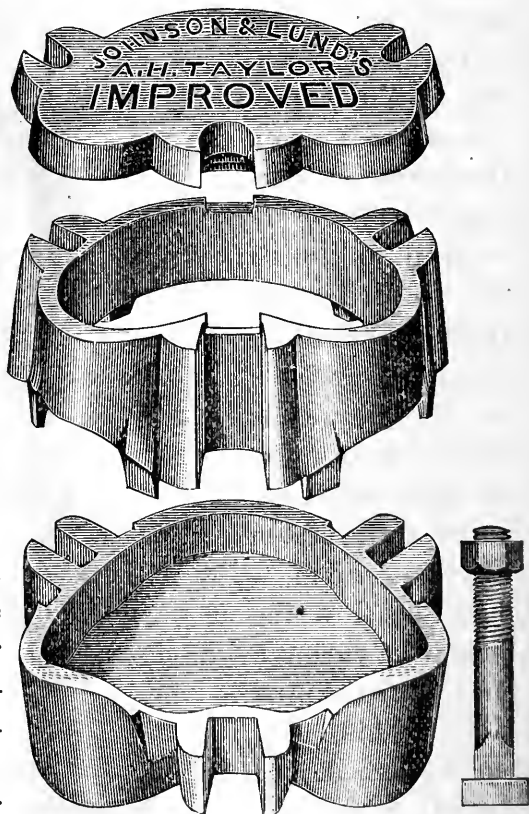


FIG. 19.

to the lower half. All of the wax is now removed from all parts of the flask and *saved* for the purpose which will be explained farther on. Should any wax remain about the pins of the teeth, it may be cleaned away by pouring a stream of boiling water into the flask,

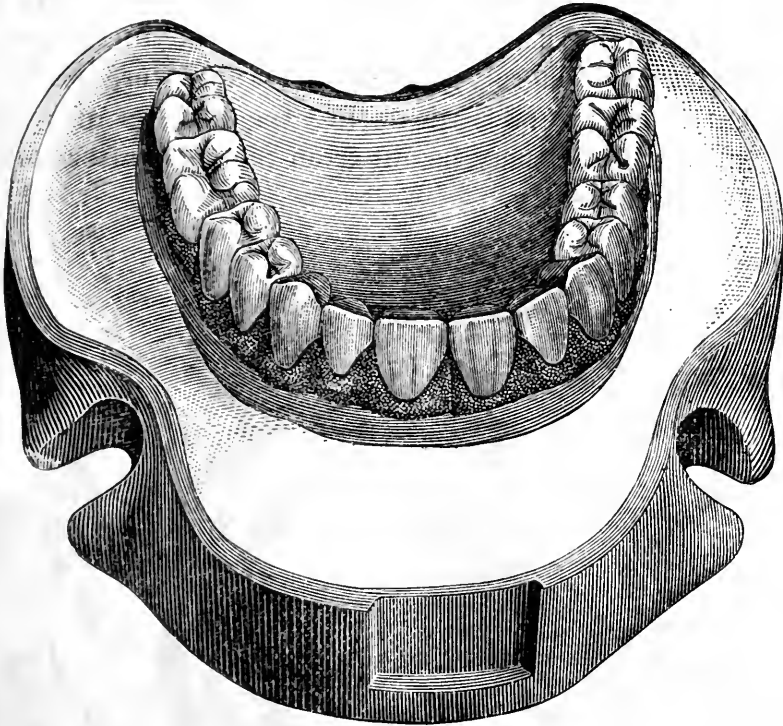


FIG. 20.

at a slight elevation. This will melt and wash away all adhering particles. Gates or outlets are now cut in the plaster, in this half of the flask, which are intended to serve as vents for the egress of all superfluous rubber. The two halves of the flask is represented by Fig. 22, the one showing the teeth imbedded in the plaster as well as the gates or outlets; the other showing model with the air chamber and raised parts (done with folds of tin-foil as previously described), embedded in the other. The model in the lower part of the flask is now covered with a sheet of thin tin-foil, such as is used for filling teeth. The object of this is to prevent the plaster from adhering to the rubber during the process of vulcanizing. The case is now packed.

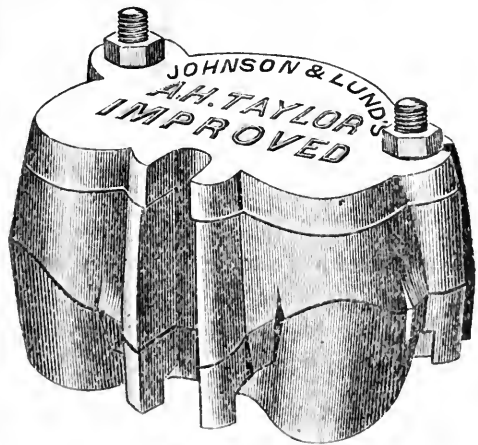


FIG. 21.

PACKING.

Before proceeding to pack the case, the joints, on the inside near the pins, between the blocks are nicely and carefully filled with some

phosphate of zinc mixed quite thin and allowed to harden thoroughly. This is for the purpose of preventing the rubber from oozing through the joints and thus marring the beauty of the workmanship—this may likewise be done on the outside, before the plaster is poured into the upper ring of the flask. It may be well to tell here why salt is recommended to be used with the plaster of investments. We have observed that if merely plaster and water were used as the investment that it gets very hard during the process of vulcanizing, but when salt is added it may be cut from the flask after vulcanizing with great ease and facility.

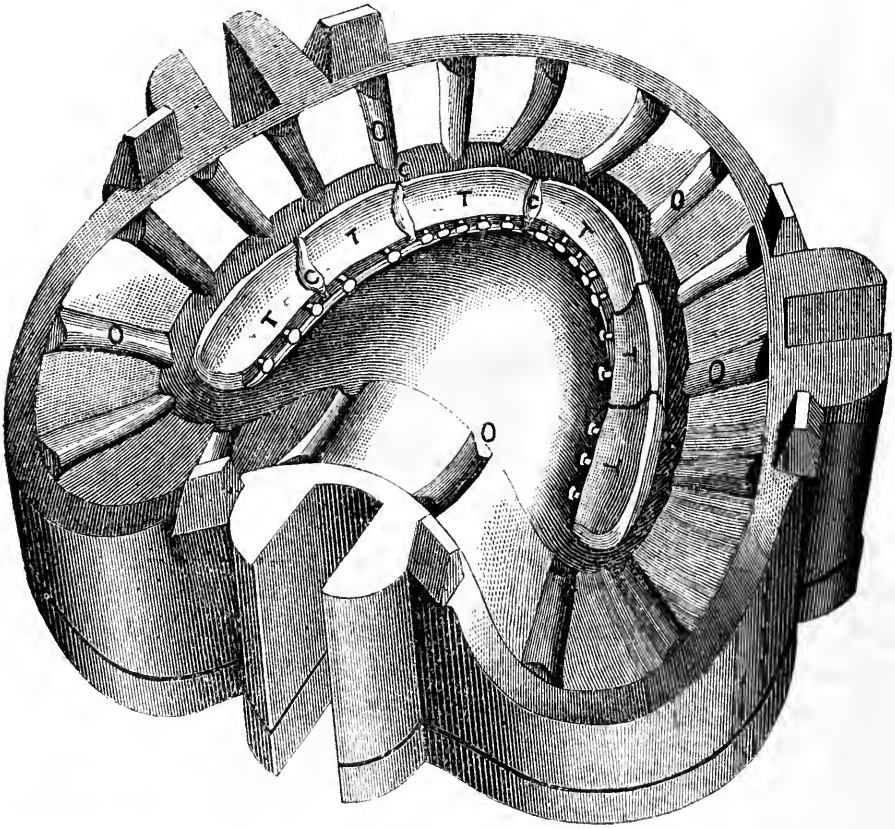


FIG. 22 (upper half).

T T T T T, represents the teeth, with the pins C C C are three of the joints filled with phosphate cement to prevent the rubber from oozing through—the other joints, on the right of the cut, are done in the same way.

O O O O, &c., are the vents or outlets to let the surplus quantity of rubber have a chance of escaping.

The wax which was saved from about the teeth, as well as the wax rim and wax base plate, are made into a ball and placed into a narrow, high tumbler. There are many thin glass tumblers of this kind sold in all glassware stores.

Water is poured into this tumbler until nearly full. A piece of thin paper is moistened with saliva and made to adhere to the outside, to the height of the water when the wax is in the tumbler.

The lump of wax is now withdrawn from the tumbler, when it will be found that the water in the tumbler will have fallen. There are tumblers of this kind fitted with a cover or top, in which there is a narrow, oblong tube, sold at the depots under the name of "The

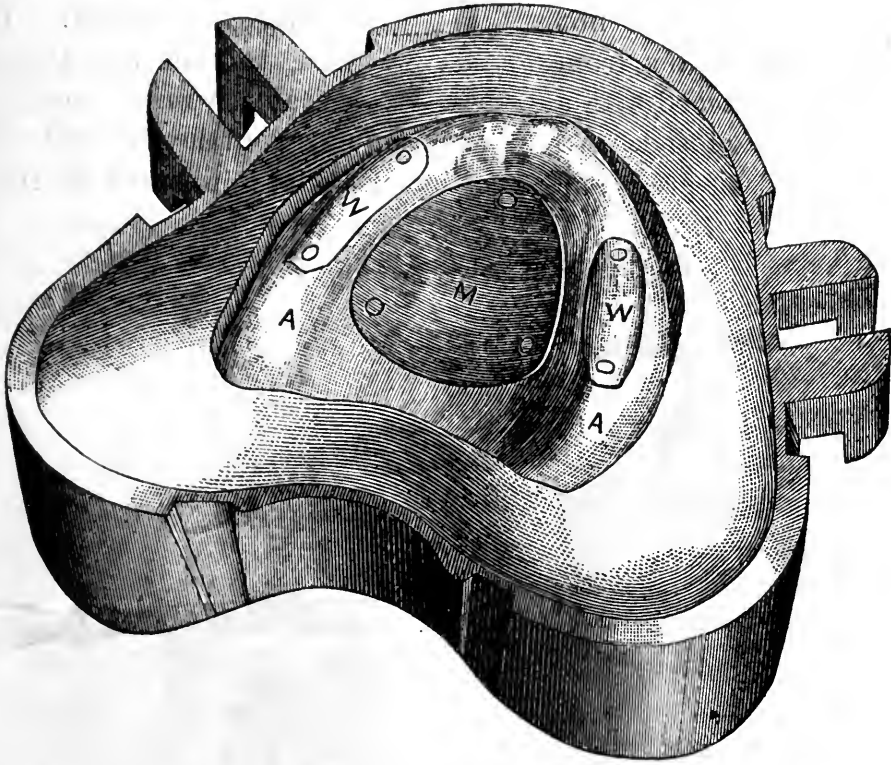


FIG. 22 (lower half).

A A, the model.

M, the air chamber.

W W, folds of tinfoil pinned down to the model, on the hard part of the ridge, designed to lift the plate and relieve pressure.

Rubber Guage." It is better adapted for the purpose and more reliable than the arrangement described of sticking a piece of paper on the outside of the tumbler. The lump of wax being withdrawn and the water subsiding in the tumbler as described. Rubber is cut up in small pieces, about the size of a dime, or smaller, and thrown into the tumbler; this is continued until the water in the tumbler rises to the same level as it did when the wax was in. A few pieces more of rubber may be added, to compensate for any unfilled space during the process of waxing, as well as to compensate for that which was washed away by the boiling water that adhered to the pins. The rubber is then removed from the tumbler and laid on a piece of clean cloth. This is laid over a pot of water which is kept boiling, by which the steam softens it when it is taken piece by piece and packed with suitable instruments into that

part of the flask in which the teeth are embedded (Fig. 22). All of the rubber being packed into this part of the flask—the other part of the flask, which contains the tion and directed correctly with which the flask is bolted together (but not taken from the boiler from of the bolts tightened with a flask is entirely closed. An pose is the “Flask press and Lukens Long.



FIG. 23.

model, is now placed in position by aid of the guide-pins provided. The case is now tightly) and boiled. It is time to time and the nuts suitable wrench, until the excellent device for this purpose,” invented by Dr. M.

FOR CLOSING FLASKS AFTER PACKING.

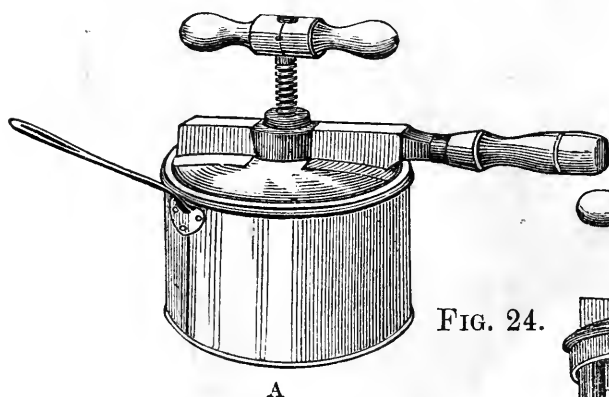
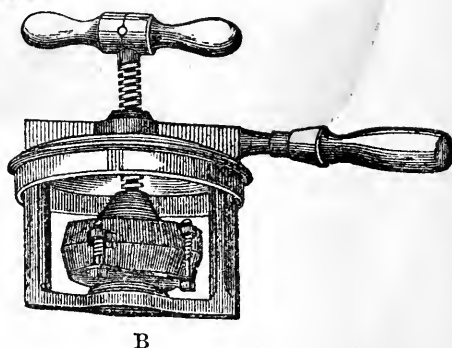


FIG. 24.



With this the rubber is softened thoroughly in the flask by the hot water in the boiler, while the press gradually forces the parts thoroughly and accurately together, not only saving the dirty work of handling the flask, but likewise the danger of breaking the blocks of teeth. There is another arrangement made for closing the flasks, termed the Flask Press (Fig. 25.)

But while it does the work it is not so handy, or so tidy as the other to which we have alluded

To be continued.

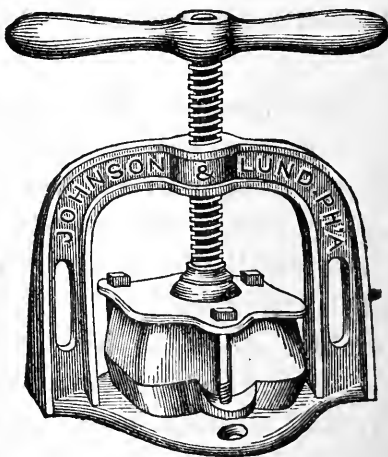


FIG. 25.

THE INFLUENCE OF EXERCISE UPON HEALTH.

BY PROF. EUGENE L. RICHARDS, OF YALE COLLEGE.

(Concluded from page 18.)

While the lungs and heart are doing better work under the stimulus of muscular exercise, the heart pumping the blood more certainly to the farthest tissue of the body, and the lungs more rapidly purifying the blood, other organs are benefited. The diaphragm, that muscle separating the lungs and heart from the stomach and liver, is rising and falling, and, with the increased expansion and contraction of the walls of the thorax, is moving all the contents of the abdomen to activity. The liver, the great gland of the body, has not only more blood sent to it, but is quickened to action. For bilious people there is no medicine like exercise and fresh air. In malarial districts, bilious people are most easily affected by the malarial poison. Though in such districts a great many troubles are conveniently laid at the door of that enemy of health which do not justly belong there; yet, of the fact that some are affected by it, and others, equally exposed, are not affected by it, may not the explanation be, that an active circulation in one person effects the elimination of the poison through the excretory organs so rapidly that it cannot collect in sufficient quantities to cause disturbance of the system? In the case of a person affected by a stupefying poison, the first thing to be done is to keep the individual moving; that is, to keep the circulation going by exercise till the poison can be eliminated. The laboring-man who works at a sewer in front of a house seldom feels any ill effects from the overturned soil and poisonous gas, while some dweller in the house, apparently not so much exposed, is stricken with typhoid or malarial fever. Causes of the immunity to the workman may be found in his greater strength and feebler sensibility, and in his open-air life; but may not another reason be seen in the quickened action of his lungs and the profuse perspiration of his skin? As to the effect of want of exercise on the liver, the following passage may be quoted from an authority on the subject; "A want of exercise in the open air leads to derangement of the liver in two ways, viz.: (a) By causing a deficient supply of oxygen to the system, as a result of which the oxidizing processes, which go on in the liver and elsewhere, are imperfectly performed, and there is a tendency to the accumulation in the system of fat and the imperfectly oxidized products of disintegrated albumen. Oxygen is, so to speak, the antidote for the destruction of *materies morbi* (lithic acid, etc.) produced by imperfectly oxidized albumen. (b) By retarding the circulation of the blood

through the liver. Since the time of Haller (1764), physiologists have recognized the influence of the respiratory movements in producing the circulation of blood through the liver; but upward of thirty years ago Mr. Alexander Shaw showed more clearly than ever before that the circulation of blood through the liver was greatly influenced by the alternate expansion and contraction of the thorax during respiration. Mr. Shaw called attention to the fact that the portal vein, without any provision for increasing its power, 'has to perform the duty usually fulfilled by an artery.' He suggested that this weak power, by which the portal vein propelled its blood, was compensated for by a suction force communicated to the current of the blood by the actions of respiration. These reasonings have been confirmed by certain experiments of M. Bernard." "In persons, then, who lead a sedentary life, this auxiliary force for promoting the circulation of blood through the liver is diminished; blood stagnates in the gland, and the functions of the organ are deranged, these results being all the more likely to arise if the liver be at the same time over-stimulated by errors in diet."*

Take another organ. The stomach is a muscular organ, being furnished with bands of muscular fiber, which squeeze and press the food, turning it over and over, so that it may be the better permeated by the juices which digest it. It, too, is stimulated by exercise, especially by an exercise like walking or riding, which increases its movement. This motion makes easier work for the organ and increases its activity. It increases its activity also in another way, by demanding more of it. For increased work by any part of the body means increased destruction of tissue. "To repair the waste is the office of the blood, as the distributor of the material to be supplied. The main furnisher of this new material in the right form to do its work is the stomach. For food is both the fuel which keeps our bodily machinery going, and the material by which the machinery itself is repaired. The stomach, with the duodenum, is the place where all this material is prepared to do its work in the most economical way. More exercise, then, means more waste, more waste means more repair, and more repair means a greater demand for food and water. The more, then, we waste any part of the body by exercise (within certain limits), if there is due repair, the better off is that part. The strength of the body, as a whole, and of each part of the body individually, is thus ever in relation to its newness."†

The bowels, too, the great sewers of the bodily system, inclosed in pliable walls needing constant motion and fresh supplies of blood for their healthy exercise, feel the action of the breathing lungs, and are

* Functional Derangements of the Liver," Murchison.

† McLaren.

sensible of every turn, twist, rising and falling of the body. Deprive the body of exercise, and you deprive the bowels of blood and proper action, and bring in a long train of evils, a catalogue of which can be read in the advertising columns of almost any daily newspaper.

The kidneys, too, are affected by physical exercise. Doubtless they receive a certain stimulation from the motion communicated to them in exercise, but as they are engaged in the work of eliminating from the system its excess of liquid with certain effete matter in solution, and as the skin is also concerned in a similar work, they are affected by exercise mostly with reference to this joint action. The more active the skin is, the less work the kidneys have to do.

To realize more definitely the work which the skin does, consider the fact that a square inch of skin is calculated to contain twenty-eight thousand pores. These pores, if healthy, are at all times purifying the blood by insensible perspiration, and in times of vigorous exercise make that perspiration very sensible. This sensible perspiration is essential to health, for the pores must occasionally be opened wide and flushed, in order to cleanse them thoroughly. Not only is this action of the skin in exercise increased by the increased flow of blood to the surface, but also by the mere motion of the muscles under the skin. This last effect might be called the direct effect of exercise on the skin. How close this connection is between the skin and muscles may be seen from the fact that "any part of the skin of the hand is in connection with, perhaps, two hundred muscles." This "fact, showing the exceedingly numerous and complicated communications between a given portion of the skin and the moving organs,"* makes it easy to conceive how the skin is stimulated to action directly by exercise.

Bodily exercise is essential to the healthy action of the brain and the nerves. There is no real conflict between brain-work and body-work. Brain presupposes body; can not exist without it; is dependent upon it for support and nourishment. Brain can not communicate with the external world, nor with other brains, so far as we know, except through the medium of the body. Consider how brain-power is formed and grows in a child. Is not the first exertion of mental power, as well as the first sign of life, connected with motion? Back of the child's outstretched hand there is in the mind a desire for something and a will to obtain it. Each consciously directed muscular action has two effects, one on the muscle used, another on the directing brain. Can there be any doubt that this mutual action of brain and body contributes to the growth of each? Can there be any further doubt that, the more organs which the brain supervises, and the more muscles which it controls and directs, the more opportunity the brain

* Bain.

has for growth? "Brain is evolved from the organization."† First, there is "growth, the force for which was supplied from a hundred sources;" and, secondly, there is "a power grown. . . . No perfect brain ever crowns an imperfectly developed body." This, then, up to certain time of life, is Nature's method of forming brain power, viz.: by the conscious activity of the bodily powers. The fact that most people are right-sided, as well as right-handed is registered in their brains; the *left* side of the brain, which supervises the *right* side of the body, being generally the larger.

In this growth of the brain, the whole nervous system is involved. The spinal cord (almost a continuation of the brain), and every nerve which from each organ brings intelligence of want, and every nerve that flashes the order to supply that want, all are brought into action by exercise, and all are nourished by the circulating blood. Think of the immense strain upon the bodily powers to keep the brain and nervous system properly nourished! It is calculated that the brain alone requires one-fifth of the entire supply of blood in the body. The drain upon the bodily vigor of a brain-worker would be greater than this fraction represents, if it were not for the law of Treviranus, according to which an organ not only takes from the blood certain materials, but also supplies to it other materials. "Just as, on a larger scale, the carbonic acid exhaled by animals is taken up by vegetables, and a poison thus removed from the atmosphere in which the animal lives, so by one organic element of the body the blood is purified from the waste matter of a higher element, which would be poisonous to it."* So, that a tired brain and quivering nerves may not be more wearied by physical exercise, but may be refreshed by it. This refreshment may result from two processes: first, by withdrawing the excessive supply of blood from the before active organ; and, secondly, by purifying the blood so that it may be ready to properly nourish the brain. And the muscular system not only acts as a store-house of vitality for the brain, and a purifier of its supply of blood, but it covers the nervous system, acting as its stay and protection. "To be weak is to be miserable. . . . Susceptibility of nerve and feebleness of muscle generally go together." To correct one deficiency is usually to cure the other weakness.

To the young, physical exercise is essential to growth, both of body and mind. Youth is not only the time to cultivate good habits, but also the time to store up vitality. At that time many abnormal developments can be corrected by appropriate exercises. At that period, too, the healthy balance between brain and body can better be established. To children, exercise is specially needful for healthy

† "Building of a Brain," Dr. Edward H. Clarke.

* Maudsley.

nerves, since, as compared with the nervous system of an adult, the nervous system of a child is five times as large, in proportion to the size of the body. In them, therefore, "that parasite of the blood," the brain, demands that a greater amount of time should be given to waste and repair of tissue by means of exercise, and that a greater amount of proper food should furnish the supply nourishment. Short intervals of study, long intervals of play or light work of body, and that in the open air, if possible, should be the rule for children. As they increase in years more time can be given to conscious celebration. At some periods of growth, all the way from the age of twelve to eighteen, according to the individual, special watchfulness is required of parents and instructors to see that the functions of growing organs are not interfered with by excessive attention to brain-work. At this critical time no study would be safer than too much study.

After a good muscular system has been developed in childhood and youth, a comparatively small amount of time judiciously devoted to exercise will keep a person in healthy working order till near the age of forty.

The age of forty to fifty is the period of life during which, according to the best authorities, the need of exercise is the greatest. "At no time of life is the necessity of exercise so imperative.* At that time the circulation becomes defective, unless continually quickened by exercise;" there is a tendency to passive congestion and functional derangements of various organs, especially the liver. At this time, though needing less food, we are apt to eat more than in the periods of life immediately adjacent. Consequently, the products of disintegrated food and tissue are not eliminated. Accumulating in the blood, they form the *materies morbi*, the matter on which death feeds.

Tiding over the period of middle life, by using appropriate exercise, and by care to see that all the excretory organs do their proper work at proper times, we ought to find the following years the best years of life, especially for brain work. If we lived rightly, the words of the poet ought to be true for us all:

"Grow old along with me!

The best is yet to be,

The last of life for which the first was made;

Our times are in his hand

Who saith, 'A whole I planned,'

Youth shows but half: trust God; see all, nor be afraid."†

As to kinds of exercise, each person must be thrown on his own judgment with regard to his own case. In McLaren's "Physical Education," and in Blakie's "How to Get Strong and How to Stay So," most excellent hints will be found for all cases. In beginning a

* "Exercise and Training," Ralfe.

† "Rabbi Ben Ezra," Robert Browning.

course of systematic exercise, it is wise to err on the side of doing too little rather than too much. Increase the amount of exercise very slowly. No discouragement should be felt if it is hard work at first. It will become easier and easier. It may be a long time before it can be taken joyfully, yet, if any person will persevere, he will be certain to rejoice in the work, and will come to feel that he can not do without it. There is no royal road to health any more than there is to learning. Like all things made precious and to be really enjoyed, health must be earned.

It may be said that, for all persons whose regular occupation is sedentary, exercise in the open air is to be preferred. The oxygen of the air is essential to the life of the blood. It is well also to take exercise as much as possible in company. One person encourages another. A man will often take part in exercise with a companion so as not to disappoint him, even if he would not exercise for his own sake. Hence one valuable feature of games or athletic sports. They must be carried on in company and by system. Another valuable feature of games and sports is that in them the mind is occupied without being taxed. It is diverted from its usual cares. The sports is that in them the mind is occupied without being taxed. It is diverted from its usual cares. The sports are well called, recreative. Both body and mind are recreated by them.

To affect the chest and the underlying organs, such as lungs and heart, the most direct means lies in exercise of the muscles of the arms and shoulders. If a person has weak lungs, one of the first objects at which he should aim should be the strengthening the muscular system covering the chest. If such a person is weak, let him begin exercise very cautiously, and increase very slowly the duration, frequency and difficulty of his exercises until he is made to breathe hard. In taking a full inspiration, not only are the lungs affected, but, strange as it may seem, the brain and spine also. "The fluid surrounding the brain and spinal cord is essential to their safety. The motions dependent on the actions of the heart are much weaker on the spinal cord than on the brain, while those connected with breathing are more constant and considerable on the former, from the more powerful distension of the veins of their spinal canal. . . . The fluid surrounding brain and spine regulates the vascular fullness," and "it is manifest that, in order to keep up the proper alternations between the brain and spinal cord, and between the heart and lungs, it is not enough to breathe pure air, but it is also necessary that it should be *deeply* breathed.*

The effect of exercise on the character is felt most of all on the will. This is very natural, for in all muscular exercise a certain amount of

* Dr. George Moore.

resistance has to be overcome, and the power which acts through the muscles to overcome this resistance is will-power. Development of muscular strength is, therefore, to a certain extent development of will. It becomes the development of the highest kind of will, that of self-mastery—when to take exercise a man resolutely overcomes the distaste for it. This feeling often comes upon us, when we are weary with brain-work and are inclined to rest, and to forego exercise. But let any man resist the temptation and take the exercise, and he will find that the brain is rested and refreshed, and the whole body renewed and invigorated.

It is not true that so much given to body is just so much taken from brain. It has been the aim of the writer so show that all parts of the body, the brain and the nervous system among the rest, contribute to the vigor of the whole; that the muscular system forms about half of the body, and is a very important contributor to the health of all the organs. Body and brain are parts of a harmonious whole. Either neglected makes trouble for the other. Each appropriately exercised means not only strength, health and to that one, but vigor to both. This hue and cry against exercise and sport, as being detrimental to mental culture, is founded on a mistaken theory that the material and spiritual parts of a man are enemies—so much less material, so much more spiritual. But it ought to be observed that a very high authority says it is the carnal *mind* which is enmity against God," and "out of the *heart* proceed evil thoughts, murders, adulteries." Man is not more of a "brute" for cultivating his body, but a better man if he cultivate both body and mind: body, first in the order of development; mind, second in order of time, but the crown and king of the whole.

THE PRACTICAL PLACE.

SENSITIVE DENTINE.

Dr. J. W. Clewes is glad the "Cocaine" craze is over for attempts to lessen the pain of extraction. His experience teaches him that a better agent is found in chloroform. He saturates cotton, the size of a large pea, with it. Let some be inhaled, some swallowed with the saliva, and the cotton itself applied to the cavity. Then proceed with your excavation. You may repeat the chloroform if you like, *but only once*. The magical effect will soon show itself, without any appearance of anæsthesia in the patient. So eminently satisfactory will be the result that a mutual gladness will prevail.—*Dental Cosmos*.

Dr. Horatio C. Meriam, D. M. D., of the Dental Department of the Harvard University, read a paper entitled, "*Gutta-Percha and its uses*"

in *Operative Dentistry*," before the First District Dental Society of the State of New York, from which we make some extracts gleaned from the *Dental Cosmos*.

"Its use in fitting by impression is of importance in treating cavities difficult of access. A small piece of gutta percha is softened by heat, and pressed into the cavity after excavation without drying. This gives the impression of the cavity; remove, and trim even with the outline of the cavity. This is then dropped in the oil of cajeput, heated, the cavity dried, and the gutta-percha carried to place and pressed home. The same method can be employed in cavities on the lingual side of the lower third molar, or in cases so far below the gum that complete dryness is impossible. The pressing in of the gutta-percha, coated with this soft mass, carries with it the moisture of the cavity, and we get adhesion under water.

* * * * *

I have no desire to recommend this, except in extreme cases.

* * * * *

As a matrix in large cavities for retaining medicine, especially when applying arsenical paste, a piece may be fitted between the teeth, and pressed out from the inside with oiled cotton, formed with burnishers, and made water-tight, and thus give for this purpose all the advantage of a crown cavity. The same may be used when filling with amalgam, for we can easily arrange for the rounded approximal contact or kumckle so much desired with a heated burnisher pressed into the gutta-percha matrix where we wish the point of contact to come. One advantage of this matrix is that it can be worn without irritation to the gums, and need not be removed until the amalgam is hardened. It is my practice to cover all dressing with a piece softened in oil, not only for cleanliness between the visits of patients to the office, but I am much better able to judge of the progress of disinfection, as it can be seen that all the odor, if any, is from the canals and not from cotton foul from being warm.

* * * * *

It may be well to state why I introduce the use of oils for softening instead of using chloroform. Chloroform completely dissolves it; I only wish to soften the surface.

NEW HÆMOSTATIC.—The methods of checking bleeding are important, and therefore, interesting to all surgeons, but especially to dentists, who so often have to deal with troublesome hæmorrhage after teeth extraction. When such hæmorrhage occurs in the case of "bleeders" (Hæmophiles) the matter assumes alarming importance. Dr. Morales, of Barcelòna, has found hazeline, (exatret of witch-hazel,) when locally applied, to act successfully, as a styptic in

hæmophilic patients when all other means, not excepting the thermocautery, have failed. Dr. Morales is of the opinion that it acts by constricting the vessels as well as by producing coagulation.—*The British Journal of Dental Science.*

NAUSEA.—The excessive nausea which some patients have when an attempt made to take an impression of their gums, especially when plaster of Paris is used for the purpose, is said to be entirely overcome by the use of a four per cent. solution of hydrochlorate of cocaine used in the form of a spray from a common hand-atomizer and thrown against the palate, or with a camel-hair pencil painted over this surface, in from three to five minutes.

TO OBTAIN ADHESION FOR ARTIFICIAL-TEETH PLATES.—An exchange states that this may be accomplished by sprinkling over the surface of the plate powdered gum Tragacanth. The powdered gum is put in a bottle, over the mouth of which is tied a piece of muslin or tarlatan. Many plates, though made on the model, from a perfect impression, fail at first to adhere either from the inability of the patient to create an exhaustion or from some other cause. The above is given by several dentists who have used it successfully, some going so far as to say that considerable force will, at times, have to be used to remove the plate when this is used. The suggestion is simple and worth the trial.

FILLING FOR PULPLESS TEETH.—The editor of the *Dental Register* has found Iodoform a useful filling for pulpless teeth. After removing the debris of the pulp, it is directed to wash out thoroughly with alcohol and work in with a broach a thin paste of iodoform made either with alcohol or glycerine. When the root is full, wipe away the surplus and cover with oxyphosphate. The whole operation, including the filling, may safely be done in one sitting.

PEARLINE.—“Pearline,” a laundry powder, sold by all grocers, is an excellent preparation for removing stains from the hands and finger nails. Try it after handling flasks and laboratory tools.

A SOLDERING FLUID, for brass or iron, composed of a teaspoonful of chloride of zinc dissolved in two ounces of alcohol, will not rust and tarnish, and has no bad odor. We found the above was best made by dissolving fused chloride of zinc in alcohol.

It is believed that strabismus is not due to the presence of a micrococci in the blood.

THE cutting of India rubber may be greatly facilitated by moistening the knife used with a moderately strong solution of caustic soda.

EXPLOSIVE MIXTURES.—Chlorate of potassa and sulphur explode readily upon trituration. They should therefore be ground separately and mixed after.

Lycopodium explodes if any of the dust falls into gaslight. Mix in the daytime.

Hypo-phosphite of calcium explodes at a high temperatures easily.

Oxalate and citrate of calcium explode at high temperature.

Permanganate of potash and any organic substance explode readily, *almost instantly*, upon being mixed together.

A mixture of chlorate of potassa or potassium, glycerine and ferric chloride explode almost instantly if super-heated. Leave out glycerine always,

Ozone powders are *very* explosive.

Iodine and ammonia explodes easily.

Sulphuric acid and oil of turpentine explode during the manufacture of tereben, a new compound among physicians.—*Nemo in Medical Summary.*

MIXING AMALGAM.—Dr. E. O. Peck, of Morristown, N. J., writes to say, "If you will take a *depressed rubber dam* and put your mercury and amalgam filings into rub together, you will never put them in your hand again, as by the dam you have clean hands; to say nothing of its being a so much better way to mix amalgam. I was told of it many years ago, and have told it to many others, and would not give it up now for any other.

OBTUNDENTS.—Preparatory to the use of an obtunder the cavity should be opened with a chisel and the debris washed out with warm water, the rubber dam should then be adjusted, and if the necks of the teeth are sensitive or the gums tender, they ought to be painted or swabbed with the tincture of cannabis indica slightly warmed. The cavities should then be dried, after which pellets of cotton moistened with alcohol may be introduced and quickly removed, and the obtunder, whatever it should be, should then be placed in the cavity and allowed to remain while you are operating on some small fissure or other non-sensitive cavity. By so proceeding you inspire the patient with confidence, gain time for the drug to act, and allow the alcohol to evaporate, which is in itself a tolerable obtunder. By preference, and from confidence in the drug, I am still using the fluid extract of cannabis indica. I find that, used in the above manner, it acts more rapidly than any other known drug which is not injurious to the teeth. In previous papers I have cautioned against too free use of the fluid

extract, as it is poisonous in large doses when accidentally used, one-half to one minim being the ordinary dose, while five to twenty minims of the tincture may be given with safety.

You will find that the tincture of cannabis indica and the fluid extract are extremely valuable in other directions than that of obtunding dentine, as you can open an abscess almost painlessly by pricking its surface two minutes before introducing the lancet. By soaking a pulp with the fluid extract for a few minutes you can remove it without pain, provided you have free access to it, so that the brush can be plunged into the canal without unnecessary fumbling around the entrance. You can use the tincture for injections around the root of a tooth, when there are fine deposits on the sides which would cause great pain in removal without its use. I habitually make great use of it with perfect results. I have extracted a few roots of teeth by injecting a drop on each side, and also painting the gums adjacent to the roots, and waiting for five minutes before removing them. The tincture should be warmed before using it for this purpose.—*Dr. Hailand in Independent Practitioner.*

A GOOD DEFINITION.—“D. D. S. or M. D.: Which?” by Geo. H. Chance, D. D. S. It will be admitted that dental surgery is a mechanical art applied, from a medico-scientific standpoint, to the dental organs and their associate parts, for the arrest and cure of disease, precisely as general surgery is a mechanical art applied from the same standpoint to other parts of the human body, and for a similar purpose, viz., for the arrest and cure of disease. Now, if the foregoing definition be accepted as correct, it logically follows that dental surgery is a legitimate branch of the healing art, and consequently a department of general medicine.

If you wish to become a dentist in something more than name, you must avoid the professional pirate, whether he sails a large ship or a small one, for we have both kinds. Secondly, place yourself with a respectable, well-informed dental surgeon, who will direct you in your preliminary studies and properly prepare you for a dental college. Thirdly, don't bother yourself about the mystical title of M. D., for after you have honorably graduated as a dental surgeon you will know why it is that in this country, at least, the once honored title of M. D. is largely a thing of the past. And when you are a dental surgeon, if you be a true man and would do unto others as you would they should do unto you, you will then seek, in general medicine, in the arts and sciences, or wherever else it may be found, what you will feel you must need—more light and more knowledge.

IF A BOY TALKS in a high, effeminate voice, cultivate his chest tones patiently but firmly—he will bless you in later years for what at

present sorely tries his patience. Be careful that your girl has that "most excellent thing in a woman"—a soft voice. Any inclination to stammering should be watched; the child should be trained to read aloud very slowly and deliberately. As it may prove helpful to some one, I will quote a set of rules given by Charles Kingsley to cure stammering, only premising that a child could be taught to hold the upper lip down with the finger during his half-hour of practice. Open your mouth. Take full breaths and plenty of them, and mind your stops. Keep your tongue quiet. Keep your upper lip down. Use your lower lip. Read to yourself out loud. Read and speak slow, slow, slow."—*Brooklyn Magazine*.

PLASTER OF PARIS IMPRESSIONS, MODELS AND INVESTMENTS.

From the last edition of that excellent work, "*Richardson's Mechanical Dentistry*," we glean some items on the above caption which may be useful hints. Experiments were made by several parties on the behavior of Plaster of Paris, mixed thick, mixed thin and mixed of medium consistency—of different makes of Plaster—mixed with warm and cold water; mixed with salt, with alum, &c., &c. After giving the warpage and expansion, one of the experimenters says: "The conclusion I draw from this is, that all plaster, either for impression taking or for models, should be cast with potash alum, when strict definite results are to be obtained; and that in the case of gum block work, that opening of the joints—which has hitherto caused so much trouble to practitioners, and, to a great extent, has prevented the more general adoption its other merits might have commanded, and which has drawn out many suggestions as to the best mode of prevention—the opening of the joints may now be entirely prevented by the use of potash alum for both matrix and model within the flask."

The quantity of potash alum recommended is three to four ounces to a gallon of water. The Plaster to be mixed of medium consistency, —neither too thick, or too thin—the filling of the impression, to make the model, as soon after removing it from the mouth as possible, and the earliest practicable use of the model on which to mold the substitute.

THE SOURCE OF SCARLET FEVER.

As the effects of Scarlet Fever are so often manifested upon teeth, the following will prove interesting:

"A report recently issued by the medical officer of the British Local Government Board presents interesting details of an investigation

which appears to have disclosed the original source of scarlet fever, and which, if provisional conclusions should be confirmed by more extended observations, may lead to the extinction of that very destructive disease. That outbreaks of scarlet fever, as of diphtheria, are often connected more or less closely with a particular milk supply, has long been known to persons engaged in sanitary investigations. It has been a familiar observation that cases of scarlet fever were frequent among the customers of certain dairymen, while other consumers, similarly circumstanced, but getting their milk from other dealers, seem to enjoy immunity. The theory, however, has prevailed that the persons who served the milk were affected by the disease, and when the boy who carried milk to customers was found to have scarcely finished peeling it seemed superfluous to look beyond him for a cause of the spread of the malady. The new view, to which a close study of outbreaks occurring last December in South Marylebone, St. Pancras, Hampstead and Hendon gives strong support, is that the milk itself is the cause of the fever. The districts named, and also St. John's woods, where the scarlet fever appeared at the same time, were supplied from a dairy the sanitary condition of which was excellent. None of the persons employed at it, or in any way connected with it, had had the fever recently, nor had there been a case of scarlet fever in the vicinity for a long time. Although the dairy was indisputably the centre from which the disease was being disseminated, it was impossible to trace any source of human infection. By dint of careful inquiry it was ascertained, however, that the commencement of the fever coincided in the point of time with the arrival of four newly-purchased cows, and it was found practicable to connect its ultimate distribution in different districts with the places successively occupied by these cows in different sheds the supplies of milk from which went into hands of different dealers. The four cows on examination turned out to be suffering from an erupted disease of the udders, which produced but little apparent illness, so that they continued to feed satisfactorily and to give plenty of milk. The case against the cows at last became so strong that a dealer among whose customers the fever was prevailing returned his supplies upon the hands of the farmer. The latter ordered the milk to be thrown away, but some of it was obtained from a cowman by poor people near by, with the result that there was an outbreak of scarlet fever among their children a week later. The disease attacked a half dozen families, but none that had not partaken of the rejected milk. The affected cows being placed under observation, it has been found that the erupted disease possesses peculiar characteristics, and that it not only spreads by ordinary contact among animals, but can be communicated to calves by inoculation. Matter obtained from ulcerations has been

cultivated in various media, and particularly in milk, in which it was found to flourish abundantly, producing strings of micrococci possessed of special character. The sub-cultures thus produced being used for inoculation are found to be more virulent than the original virus. Calves were made extremely ill—one was killed, by inoculation with the sub-culture, while but little affected by treatment with virus flesh from the cow. The conjecture is made that in milking a diseased cow pressure upon the udder brings down into the pail infected particles from the sore places left by the eruption, and that the milk into which they fall practically corresponds to an artificial culture of the micrococcus, such as has been found capable of exciting serious and fatal disease when introduced into calves by inoculation. Inoculated calves killed for examination were found to be suffering from inflammatory changes in several vital organs, and especially the kidneys, of a kind absolutely indistinguishable from those that occur in the same organs in the course of human scarlet fever. That persons taking the strings of micrococci developed in milk into the stomach would have the scarlet fever has not been demonstrated by experiment, through the experience of the families that used the milk that was ordered to be thrown away may be said to point to that conclusion. To boil such milk thoroughly would destroy the scarlet fever micrococcus, if such there be. Science may, however, be invoked to provide us after a time with better means of neutralizing this and other disease germs.—*American Journal of Dental Science.*

BLINDNESS DUE TO DECAYED TEETH.

Dr. Wldmark, a Swedish surgeon, having as a patient a young girl who was completely blind in one eye; observing considerable defects in the teeth, sent her to M. Skogsborg, a dental surgeon, who found that all the upper and lower molars were completely decayed, and that in many of them the roots were inflamed. He extracted the remains of the molars on the right side, and in four days' time the sight of the right eye began to return, and on the eleventh day after the extraction of the teeth it had become normal. The diseased fangs on the other side were subsequently removed lest they should cause a return of the ophthalmic affection.—*Scientific American.*

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Take Impression of the Mouth, or any other purpose where
a Perfect Impression is required.




DIRECTIONS.—Soften the Composition in hot water, and when soft enough work into the desired shape with the fingers ; place it in the cup, and then soften the surface with dry heat. This makes the surface softer than the main body, it takes a better impression, and hardens quicker. Should dry heat be used exclusively, wet the fingers occasionally, to prevent the Composition from sticking. It is not necessary to oil the impression before pouring the plaster cast, as the Composition can be easily removed by immersing for a few minutes in hot water.

No. 0.—EXTRA SOFT.—This grade is for restoring any of the other grades which have become hard by frequent use ; they may be mixed in hot water.

No. 1.—SOFT.—This grade is for use in cold water and in tender mouths, and softens at a low heat ; hardens in two minutes.

No. 2.—MEDIUM.—This grade is mostly used, and requires a higher heat to soften than No. 1, and sets quicker.

No. 3.—For use in hot weather, and requires a higher heat to soften than No. 2, and hardens quicker.

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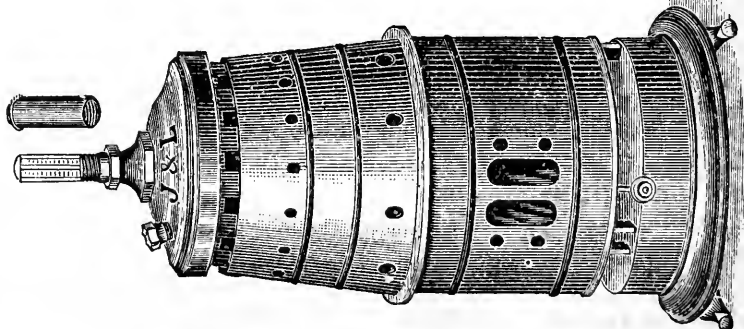
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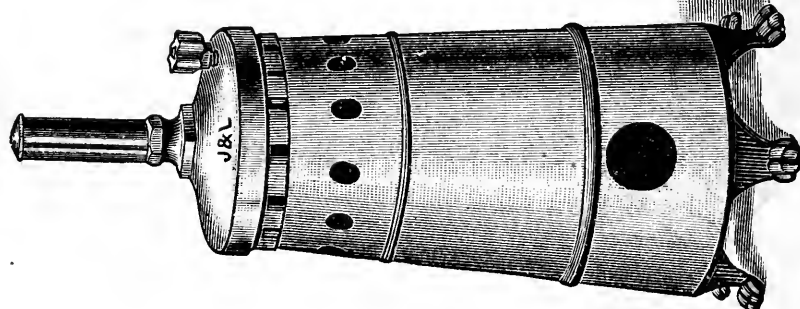
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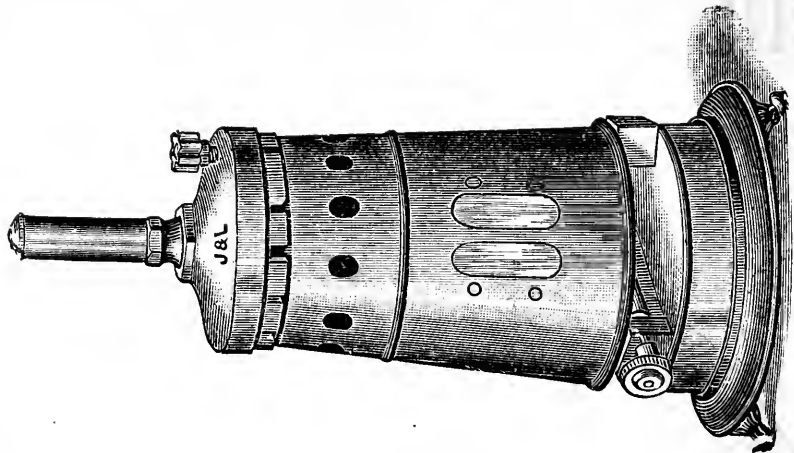
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Donham's Spring Pressure accompanying Vulcanizer, adds \$1.25 to the Price.

These vulcanizers are made in the general style of the "Whitney." The boilers are of extra thick copper, and made much wider than those in ordinary use. The inside diameter of the JOHNSON & LUND Vulcanizer measures fully $4\frac{1}{4}$ inches, while the "Whitney" and "Hayes" measures but 4 inches. The great advantage of this increased diameter will be appreciated at a glance, as it enables the dentist to use the largest size of flasks when necessity demands it. That the profession may be thoroughly satisfied of the ample strength of these vulcanizers, we assure them that each boiler has been tested by and sustained a hydrostatic pressure of 500 lbs. to the square inch; and as the elastic force per lb. to the square inch at 320° Fahrenheit (the degree at which dental plates are generally vulcanized), is but 88 lbs., our Vulcanizers are capable of resisting more than six times the strain required. But this liberality of resisting power is no excuse for carelessness on the part of the operator.

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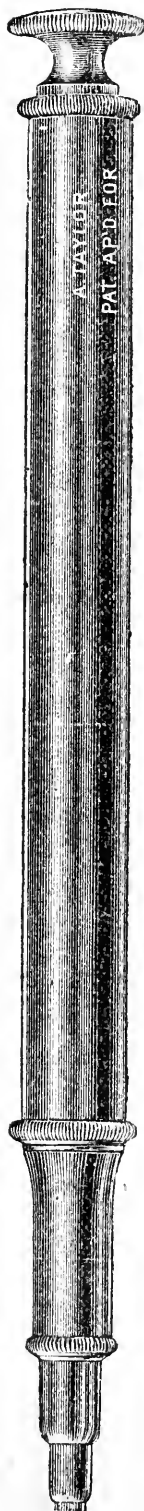
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These instruments are furnished in the best manner, and handsomely nickel-plated. They carry the Snow and Lewis points.

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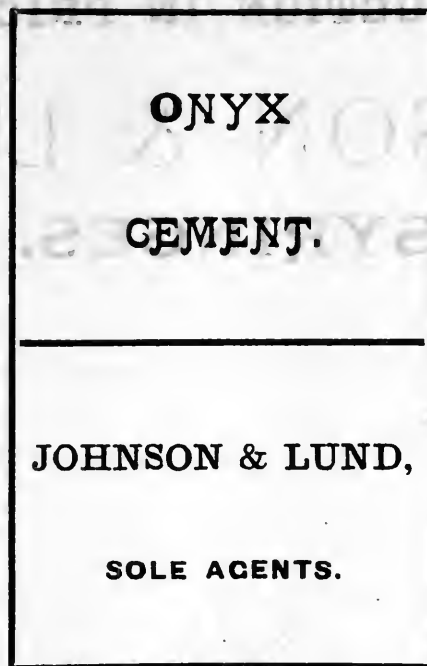
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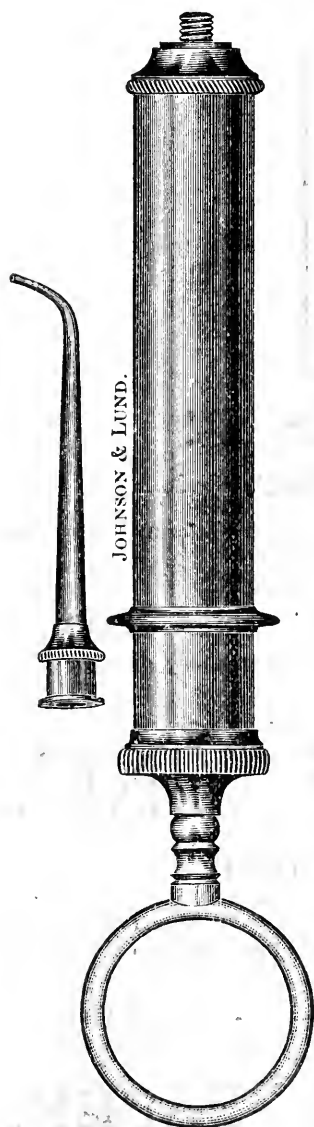
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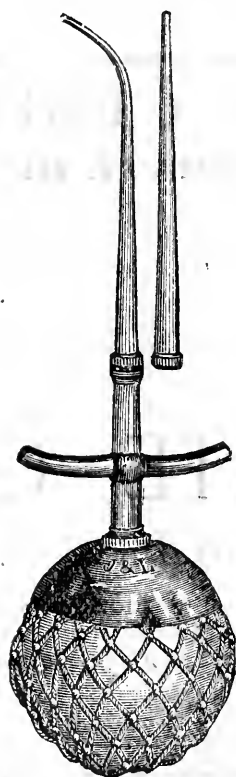
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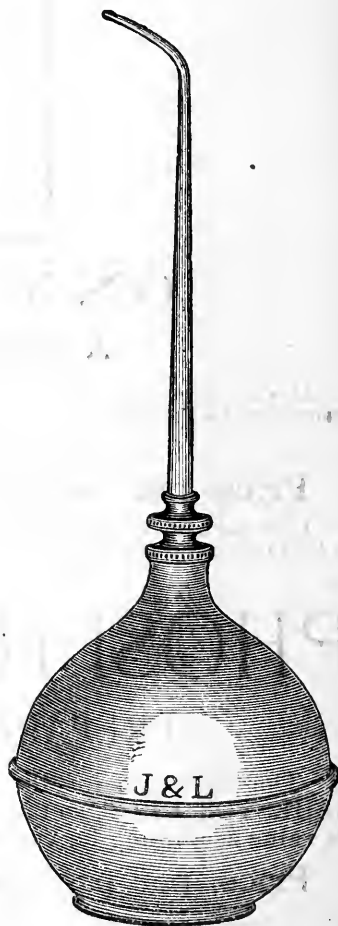
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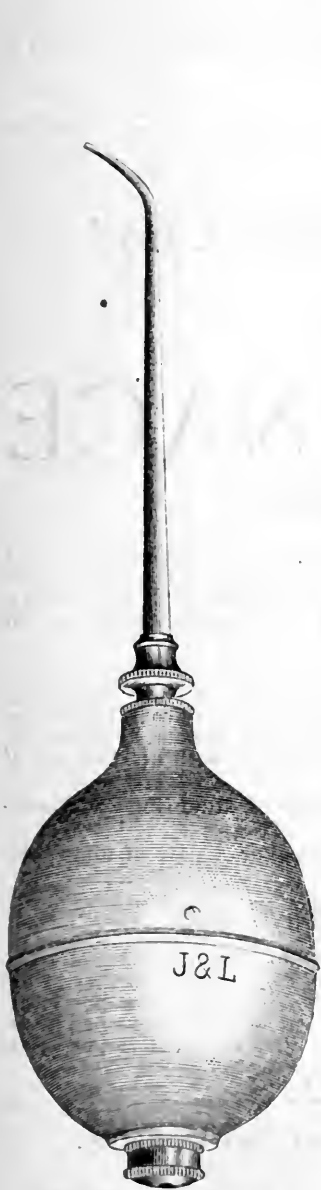
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as Finger-hold, - - - - -	each, \$1.00
Elastic Bull Syringe (Dr. Moffatt's), two Pipes, - - - - -	each, 2.00
Chip Syringe, Nickel-plated, with flat-bottomed Rubber Bulb, -	each, .75

JOHNSON & LUND,
PHILADELPHIA. **CHICAGO.**

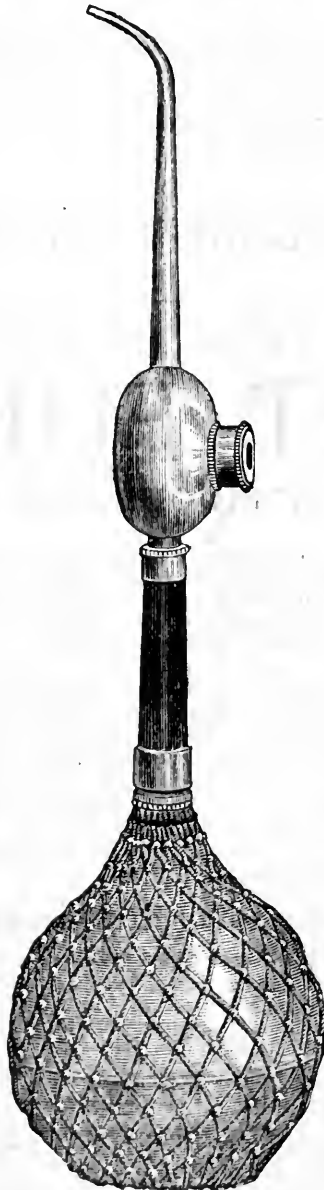
REDUCTION IN PRICES

OF

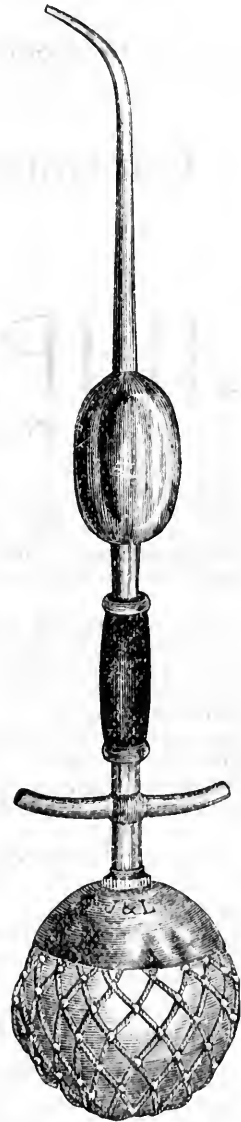
JOHNSON & LUND'S SYRINGES.



CHIP-SYRINGE.



HOT-AIR SYRINGE.



HOT-AIR SYRINGE.

Chip Syringe, Nickel-plated, with valved bulb, each	-	-	-	\$0.85
Hot-air Syringe, Nickel-plated, with flat bottomed Rubber bulb, with Silk Netting, each	-	-	-	2.75
Hot-air Syringe, Nickel-plated (Dr. Moffatt's), Round bulb, with Silk Netting, each	-	-	-	2.75

JOHNSON & LUND,
PHILADELPHIA:

CHICAGO.

NEW!  ENTIRELY NEW!  NEW!

◇ JAPANESE PELLETS, ◇

OUR OWN DIRECT IMPORTATION.

(FOR ABSORBING MOISTURE IN THE MOUTH.) MADE IN JAPAN FROM THE FINEST QUALITY.

JAPANESE BIBULOUS PAPER,

Put up in Boxes Containing 1000 Pellets Each, Assorted Sizes.

THESE PELLETS WILL BE FOUND EXCEEDINGLY CONVENIENT TO HANDLE, AS THEY
ARE ALWAYS READY FOR USE.

Price per box, containing 1000 Pellets, - - - 75 Cents.
Sent Postage Free upon Receipt of Price.

Continuous Gum-Work Made Easy!

DR. TEES' LILIPUT FURNACE FOR CONTINUOUS GUM-WORK.

This furnace is the result of experiment on the part of Dr. Tees, to get the requisite amount of heat, with the expenditure of the least amount of fuel. Although fifteen inches high, twelve inches wide, and eight inches deep, yet the heat of the muffle is intense enough to fuse the enamel of the teeth again, after being *etched*; and, excepting the hottest days of summer, the laboratory will not be uncomfortably warm.

With the **Liliput Furnace**, with the proper and convenient appurtenances accompanying it, with one kind and size of fuel, and with the management of the Furnace heats, heretofore considered the most difficult part of the work, reduced to a clock work-system, a novice, by careful attention to the directions and instructions, may be successful with his first set of **Continuous Gum**.

Instructions in pamphlet form, for "Dr. Tees' Simplified System of Mounting and Mending Continuous Gum-Work," accompany each Furnace.

With the Furnace are two muffles, one ash-pan, one slide, a poker, a pair of tongs, two coke-screens, and one-half pound of kaolin.

Price of Furnace, with necessaries as above. \$30.

Boxing, \$1 extra. Extra muffles, 75 cts. each.

Body	\$1 50 per 1 oz.
Light Colored Gum Enamel	1 25 per 1/2 oz.
Medium Colored Gum Enamel	1 25 per 1/2 oz.
Dark Colored Gum Enamel	1 25 per 1/2 oz.

AMBLER TEES, D. D. S.,

548 NORTH SEVENTEENTH STREET, PHILADELPHIA.

KNOXVILLE DENTAL DEPOT,

No. 11 Asylum Street, Knoxville, Tennessee.

Where May be Found a Complete Assortment of Dental Supplies.

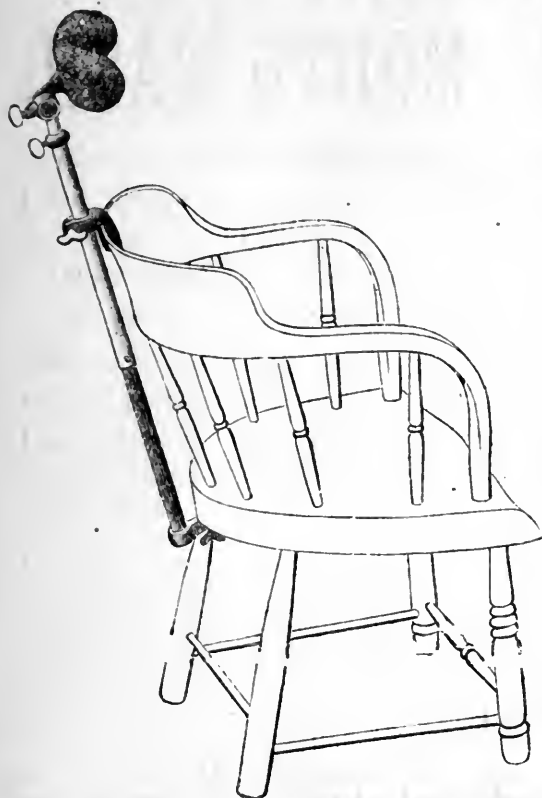
I keep all Dental Goods and Instruments

Made and Handled by

JOHNSON & LUND;

M. M. HARRIS, Proprietor.

PORTABLE HEAD-REST.



This Head Rest can be attached to any chair, is very firm and can be raised, lowered, or moved backward or forward without interfering with the attachment to the chair. It occupies a space only 13x4 inches, and weighs less than four pounds.

PRICE, \$5.00.

DALY'S CHEMICALLY PURE GOLD LINING.

Rubber Sore Mouth Cured and Prevented.

EACH BOOK CONTAINS 8 SQUARE INCHES OF GOLD LINING.

OLD RUBBER PLATES LINED.

EVERY PART OF NEW OR OLD PLATES CAN BE LINED WITH IT.

This lining presents advantages that no other can. It is formed entirely of chemically pure gold. It is united mechanically with the rubber of the plate without the intervention of any other metal or of rubber or any other cement between it and the plate.

Being so formed and so united there can be no tarnish or chemical change of state from the action of the secretion of the mouth, or from the effects of galvanic action between different metals in contact. Its union with the rubber is so perfect that it cannot be separated from it, and its removal involves the destruction both of the lining and the portion of rubber with which it is in contact.

Every surface of the plate can be lined with it if so desired. Old plates, no matter how long worn, can be lined with it, preserving perfectly the fit and articulation. Being formed entirely of pure gold, it will not only prevent rubber sore mouth, but will cure that disease where applied to rubber plates that have produced it.

The cost of lining plates with it will be seen to be small by taking the price of a book of it and counting how many plates of different sizes can be covered by eight square inches of lining, the amount contained in each book.

Full Instructions with Each Book.

PRICE, PER BOOK \$3 50

The following named dentists in Baltimore and Washington made arrangements as published in the *Baltimore Sun* of January 5th, 1886, to use this lining:

BALTIMORE.—Doctors T. S. Waters, W. H. Hoopes, W. B. Finney, C. E. Duck, T. H. Dary, S. C. Pennington, J. C. Uhler, O. F. McDonald, B. M. Wilkerson, J. B. McPherson, B. Holly Smith, C. E. Bierbower, W. S. Norris, A. P. Krouse, J. A. Webb, A. G. Finney, E. P. Keech, M. W. Foster, A. P. Gore, T. W. Coyle, T. F. Cherry, W. P. Welsh, H. G. Ulrich, Bernhard Meyer, T. F. Lang, A. J. Brown, A. J. Volck, H. E. Hardey, C. S. Grindall, W. A. Mills, J. H. Parker, L. J. Pearce, J. E. Orrison.

WASHINGTON.—Doctors James B. Hodgkin, L. C. F. Hugo, H. M. Schooley, Wm. Merrill, D. O. Knight, Thos. O. Hills, M. F. Finley, R. N. Gunnell, S. B. Muncaster, J. B. Ten Eyck, S. F. Newton, Geo. B. Welch, John L. Wolf, E. R. Rust, R. Finley Hunt, W. Donnally, H. B. Noble, E. R. Bliss.

IMPORTANT.

TOOTH POWDER. MOUTH WASH.

To all whom it may concern. If you prefer furnishing your patients with preparations for the Mouth and Teeth under your own label—we make you the following liberal offer: If you will buy *not less* than Six dozen bottles Tooth Powder, or *not less* than Six dozen bottles Mouth Wash at one time, you will be privileged to select any name you desire to sell the goods under, in place of our proprietary names and we will so label the bottles using the selected names in place of either “Doucehaleine” or “Odontophile” as the case may be, and substituting your name and address as proprietors, in place of our own, without any additional charge.

JOHNSON & LUND.

PRICES.

“DOUCEHALEINE.”

A MOST DELIGHTFUL MOUTH WASH.

In Bottles Fitted with Fine Metal Top.

	Per 1 doz.	Per 3 doz.	Per 6 doz.	Per 12 doz.
Size No. 1	\$4.00	\$10.80	\$20.40	\$38.40
“ “ 2	2.00	5.40	10.20	19.20

“ODONTOPHILE.”

AN ELEGANT TOOTH POWDER.

In Bottles Fitted with Fine Metal Top.

	Per 1 doz.	Per 3 doz.	Per 6 doz.	Per 12 doz.
Size No. 1	\$4.00	\$10.80	\$20.40	\$38.40
“ “ 2	3.00	8.10	15.30	28.80
“ “ 3	2.00	5.40	10.20	19.20

JOHNSON & LUND,

620 Race Street, Philadelphia.

514 Wabash Avenue, Chicago.

B. L. KNAPP & CO.,

161 TREMONT STREET, BOSTON, MASS.

Have Constantly on Hand a Large Stock of Johnson & Lund's IMPROVED ARTIFICIAL TEETH, EXTRA TOUGH RUBBER, EXTRA AMALGAM, ONYX CEMENT, LATHES, VULCANIZERS, IMPRESSION CUPS, &c., &c.

Give them a call, and you will receive a prompt and satisfactory response.

A. W. SEE & CO.

1288 BROADWAY, NEW YORK.

BRANCH DEPOT:

374 Fulton St., Brooklyn, N. Y.

Dealers in JOHNSON & LUND'S Improved Artificial Teeth, Extra Tough Rubber, Crimson-Brown Rubber, Light and Dark Red Rubber, Extra Amalgam, Onyx Cement, Johnson & Lund's Lathes, Johnson & Lund's Vulcanizers, Impression Cups, and a full line of Dental Goods generally.

Dentists will do well to call upon them before purchasing elsewhere.

EUREKA CEMENT

Will bring out a perfect joint in Gum sections of rubber plates every time. Money will be refunded to any one who, after using according to the new directions, fails to accomplish what we advertise. No office right to buy. A sure preventative for dark or spread joints. This Cement is prepared expressly for this purpose, and cannot be used for filling teeth. Since the introduction of our Cement a manufacturer has bought a little carmine at a drug store, colored the powder of his Cement and makes the assertion that he has made it for years. We were the first to prepare a Cement for this purpose. Our packages contain eight times the amount of material sold by other firms.

Price, \$1.00 per package.

BUCK & CO.,

Brockport, N. Y.

FOR SALE BY

JOHNSON & LUND,

620 RACE ST., PHILADELPHIA.

514 WABASH AVE., CHICAGO, ILL.

CHAS. ABBEY & SONS, DENTISTS' FINE GOLD FOIL.

SOFT, OR NON-ADHESIVE, AND ADHESIVE.

ALL FROM ABSOLUTELY PURE GOLD.



230 Pear Street, Philadelphia.

POSSESSES THE GREATEST FREEDOM FROM SHRINKAGE.

IT RETAINS ITS BRIGHTNESS.



oz. Troy.
**EXTRA TOUGH
GOLD
AND
PLATINA ALLOY**

A notable Tooth Saver.

The proportions of Gold and Platina in this Alloy with the Combination of Silver, Tin, &c., cause it to harden quickly and to maintain its edge strength. Use as little Mercury as will make a stiff plastic filling, and place in cavity without washing.

JOHNSON & LUND,

SOLE AGENTS,

620 Race St., Philada.

514 Wabash Ave., Chicago.

IMPERVIOUS to the SECRETIONS of the MOUTH.

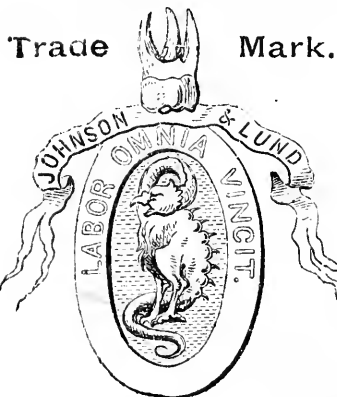
WORKS WITH GREAT PLASTICITY AND PACKS DENSELY.

PRICES.

Per ounce	\$ 3 00
" half ounce	1 50
" two ounces purchased at one time	5 40
" three " " "	7 65
" four " " "	9 76
" five " " "	11 75
" ten " " "	20 00

When money accompanies the order, the Amalgam will be sent postage free

Virgin White Alloy for Front Teeth.



The prominent qualities of this Alloy are its WHITENESS and FREEDOM FROM SHRINKAGE. Fillings made of this Amalgam, in tubes five or six times the diameter of those usually employed in the "leakage test" with blue or purple ink, give no perceptible indications of permeation of fluid. Though designed especially for front teeth, yet it will stand mastication well anywhere in the mouth. For crown cavities, however, we recommend the EXTRA TOUGH GOLD AND PLATINA ALLOY, as that is made with especial regard to edge strength.

PRICES.

Per ounce	\$ 2 00
" half ounce	1 00
" two ounces purchased at one time	3 80
" three " " "	5 40
" four " " "	6 80
" five " " "	8 00
" ten " " "	15 00

When money accompanies the order, the Amalgam will be sent postage free.

It Retains its Brightness.

It works with great Plasticity, and packs densely.

Oz. Troy.

Extra Amalgam.

GOLD AND

JOHNSON & LUND

LABOR OMNIA VINCIT.

PLATINA ALLOY.

TRADE MARK.

JOHNSON & LUND,

SOLE PROPRIETORS,
620 RACE ST., PHILADELPHIA.
514 WABASH AVE., CHICAGO.

It possesses the greatest possible freedom from shrinkage.

Impervious to the Secretions of the mouth.

PRICES.

One	Ounce Package	\$ 3 00
Two-thirds	" "	2 00
One-third	" "	1 00
Two Ounces, purchased at one time		5 40
Three "	" "	7 65
Four "	" "	9 75
Five "	" "	11 75
Ten "	" "	20 00

When money accompanies the order, the Amalgam will be sent postage free.

REDUCTION IN PRICE.

RUBBER BOWL FOR MIXING PLASTER.



These Bowls are made of soft rubber, almost one-eighth of an inch thick. They cannot be broken. Their sides can be pressed together so as to form a lip or spout for pouring out soft plaster. The plaster that remains in them and becomes set can be thoroughly crushed and removed by squeezing the sides of the bowl together.

Inside measurement, $4\frac{1}{4}$ inches in diameter by $3\frac{1}{8}$ inches in depth.

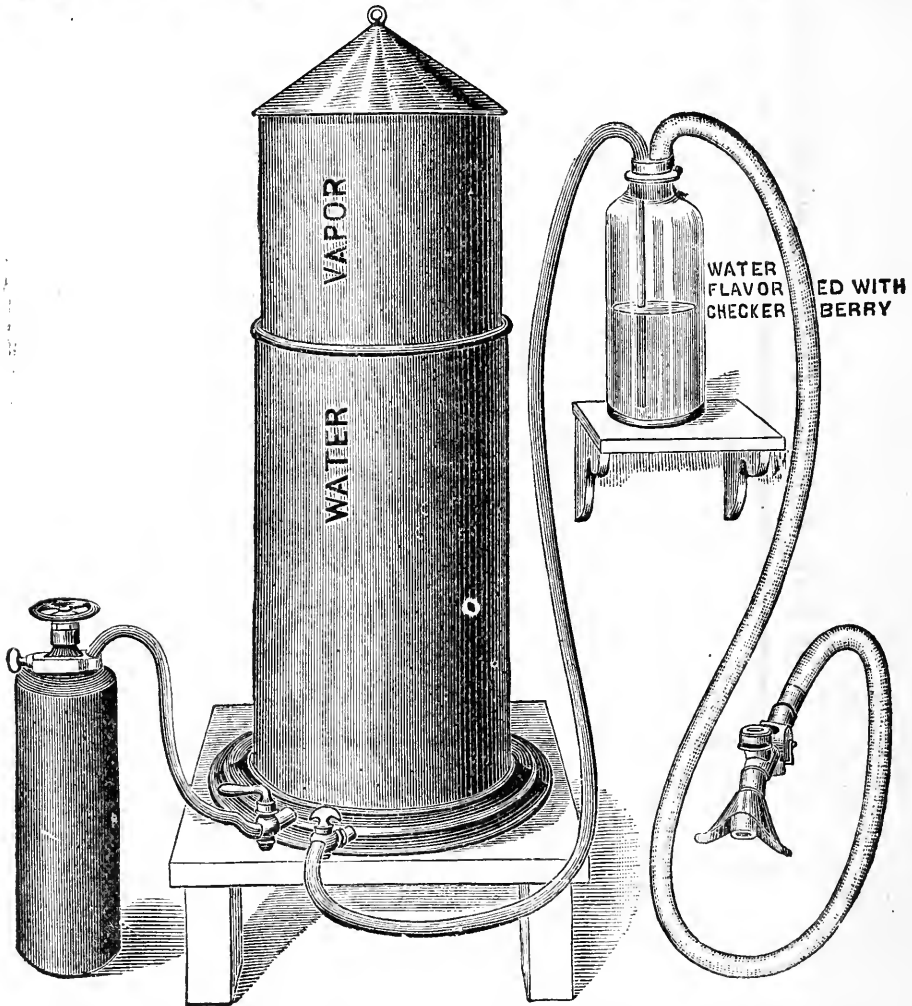
PRICE, 60 CENTS EACH.

A New Discovery?

A New Discovery!

FAR SUPERIOR TO LIQUID NITROUS OXIDE!

THE VEGETABLE ANÆSTHETIC.



It is without any of the objectionable features peculiar to other Anæsthetics; on the contrary it builds up the tissues, quickens the circulation and adds oxygen to the system. The properties of the herbs from which it is manufactured are hypnotic, diaphoretic, stimulative and antispasmodic. The patient awakens from the sleep refreshed and cheerful, and reports the sensations and effects as most agreeable. It is given to the youngest children, the most sensitive persons, as well as the aged and enfeebled, and no injury has resulted, or in the nature of the Anæsthetic can result from its inhalation.

As an assurance of the safety and perfect reliability of this new Vapor, we publish the following recommendation from physicians and dentists who have been and are now using the New Vegetable Anæsthetic:

"We have used the Vegetable Anæsthetic since January last—over a year—*exclusively*, in our practice, both for the extraction of teeth and minor operations in surgery. We have administered it repeatedly in heart disease, severe lung diseases, Bright's disease, etc., etc., where the patients were so feeble as to require assistance in walking, many

of them under medical treatment, and the results have been all we could ask. No irritation, suffocation nor depression, and so pleasant to inhale—in fact, from its many good qualities, we can heartily recommend it to all as the Anæsthetic of the age, and should very much regret going back to the use of nitrous oxide gas and ether.

FRIZZEL & WILLIAMS, Dentists,

Lee Hall, Lynn, Mass.

The apparatus consists of a cylinder, gasometer, inhaling bottle and inhalers, together with the different sizes of rubber tubing necessary. The advantages of a gasometer over a gas-bag must be self-apparent. The Vapor left in a bag after an operation, soon evaporates ; but it will remain in a gasometer an indefinite time. It is much more convenient and always ready.

The bottle acts as an indicator, likewise a stop-valve. No vapor can escape through the water until inhaled, and should the patient stop inhaling, it is at once detected, as the faintest inhalation causes the water to bubble.

DIRECTIONS.—Fill the tank to within a few inches of the top with water; balance the upper part of gasometer so that a faint bubble will be forced from the water in the bottle. Fill the bottle with water sufficient to cover the perforated holes in long glass tube, and flavor slightly with checkerberry; change the water—say every 100 gallons of vapor used.

PRICES:

100-gallon Cylinder, empty	\$10 00
200	10 00
100 Gals. Vapor, 5c. per gal.	5 00
200 4c.	8 00
Connection	1 00
Indicator and Safety Bottle each,	2 00
Gasometer	10 00
Inhaler, Improved	10 00
Rubber Face Piece	1 00
Small Rubber Tubing per foot	16
Medium	25
Large Size	35
Tripod for 100-gal. cylinder	4 00
" 200-gal.	5 00
1 or Checkerberry	50

Analysis of Vapor made by James F. Babcock, Analytical and Consulting Chemist, State Assayer and Inspector of Liquors, late Professor of Chemistry in Boston University and Massachusetts College of Pharmacy.

VEGETABLE ANÆSTHETIC Co.:

Gentlemen—I have made a chemical analysis of a cylinder containing one hundred gallons of the Anæsthetic manufactured by your Company, and find that the same consists of a basis of nitrous oxide, combined with the volatile active principles of several well-known vegetable anodynes and sedatives, which are calculated to increase its efficiency. I find the Anæsthetic to be free from *chloroform* (which has sometimes been detected in compressed gas), and that it is likewise free from any dangerous or objectionable constituents. I cheerfully recommend this Anæsthetic to dentists and others as worthy of general confidence.

Respectfully,

Respectfully,

JAMES F. BABCOCK.

FOR SALE BY

JOHNSON & LUND,

620 RACE ST., PHILADA.

514 WABASH AVE., CHICAGO.

1000 FINE

JOHNSON & LUND'S
DOUBLY REFINED

EXTRA TOUGH GOLD FOIL.

PHILADELPHIA 620 RACE ST. **DENTAL DEPOTS** CHICAGO 514 WABASH AVE

COHESIVE. EXTRA COHESIVE.
SOFT OR SEMI-COHESIVE.

Each Grade Uniform in Quality. Does not Ball up under the plugger. Its absolute purity is unquestioned.

Nos. 3 to 240.

Works with the utmost smoothness. Exhibits great softness under the burnisher. Possesses a wonderful amount of durability and toughness.

PRICE.

Per $\frac{1}{8}$ ounce,	-	-	\$4.00	Per 1 ounce,	-	-	\$29.00
" $\frac{1}{4}$ "	-	-	7.75	" 2 "	-	-	57.00
" $\frac{1}{2}$ "	-	-	15.00				

THE BEST COFFER-DAM RUBBER.

Impossible to make any Better—35 inches wide.

The above Rubber-Dam is made especially for us and to our own particular order, so that we know just what we offer to the profession and what we know is, that it is impossible to make any better, sometime since we were obliged to buy some Coffe-Dam Rubber, which was advertised as a *very superior article*, to supply a customer who was impressed with the advertisement of the same, the result was, that he found it tender and returned it to us unfit to be used, we replaced it with our own, with which he was very well satisfied.

Thin,	per yard, \$1 00
Medium,	" " 1 50
Thick,	" " 2 00

CAUTION.

Much of the Coffe-Dam Rubber advertised by other depots, and offered by their travelers is but 26½ inches wide, is 20 per cent. less material to the yard than ours. For instance our Medium 35 inch wide at \$1.50 per yard is as cheap as 26½ inch of equal quality would be at \$1.12½ per yard.

JOHNSON & LUND,
620 Race St., Philadelphia. 514 Wabash Ave., Chicago.

WATTS'
CRYSTAL GOLD,
\$4.00 per one-eighth ounce.
JOHNSON & LUND.
Philadelphia and Chicago.

SEPARATING FILES.
*J. M. EARNEST'S MAKE ARE THE
VERY BEST without doubt.*
No. 000 per dozen, \$1 25
All other numbers, per dozen, . 1 00
JOHNSON & LUND.

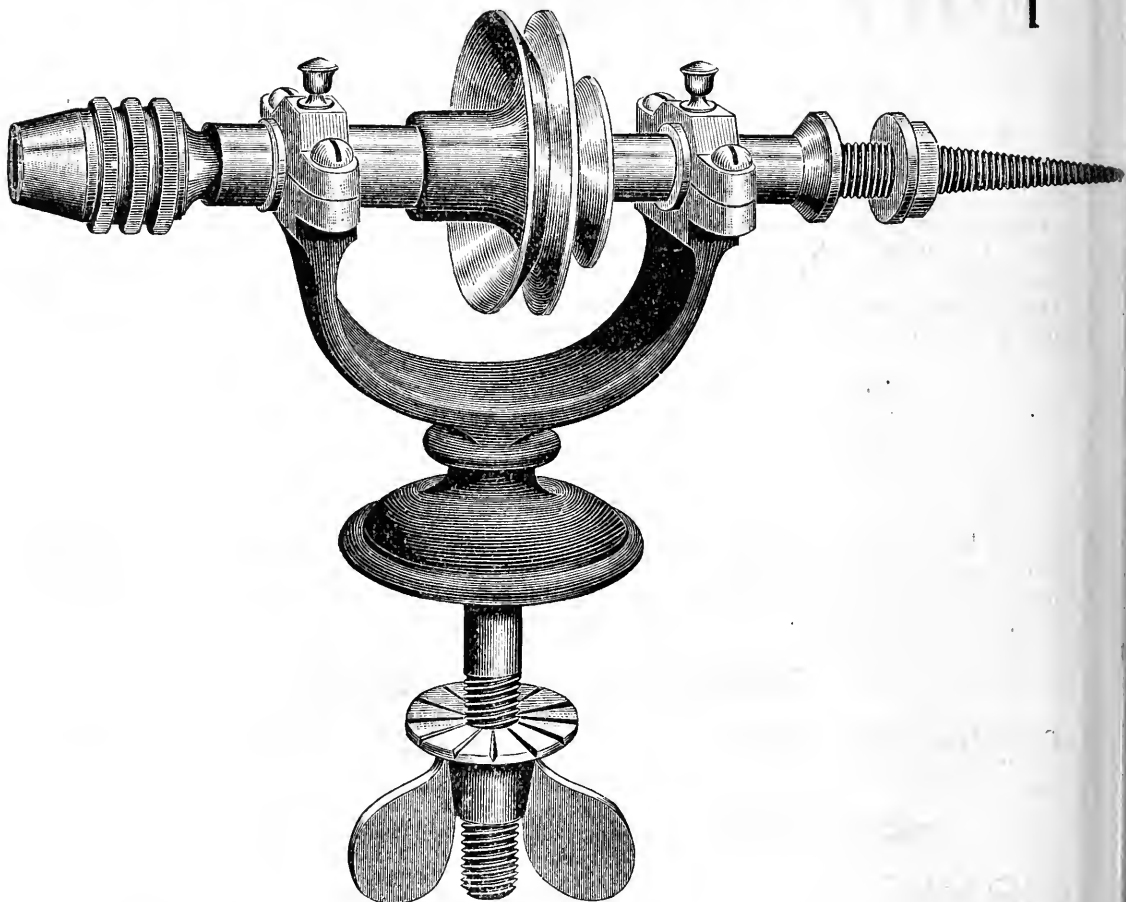
NERVE BROACHES,
THE BEST.
Assorted Sizes,
75 CTS. - PER DOZEN.

NERVE PASTE.
ARSENIC and CREOSOTE.
35 Cents, per Bottle.

THERMOMETERS
For VULCANIZERS,
THE MOST RELIABLE.
75 CENTS EACH.

PHENOL SODIQUE,
50 Cs. per Bottle.

LATHE HEAD No. 4.

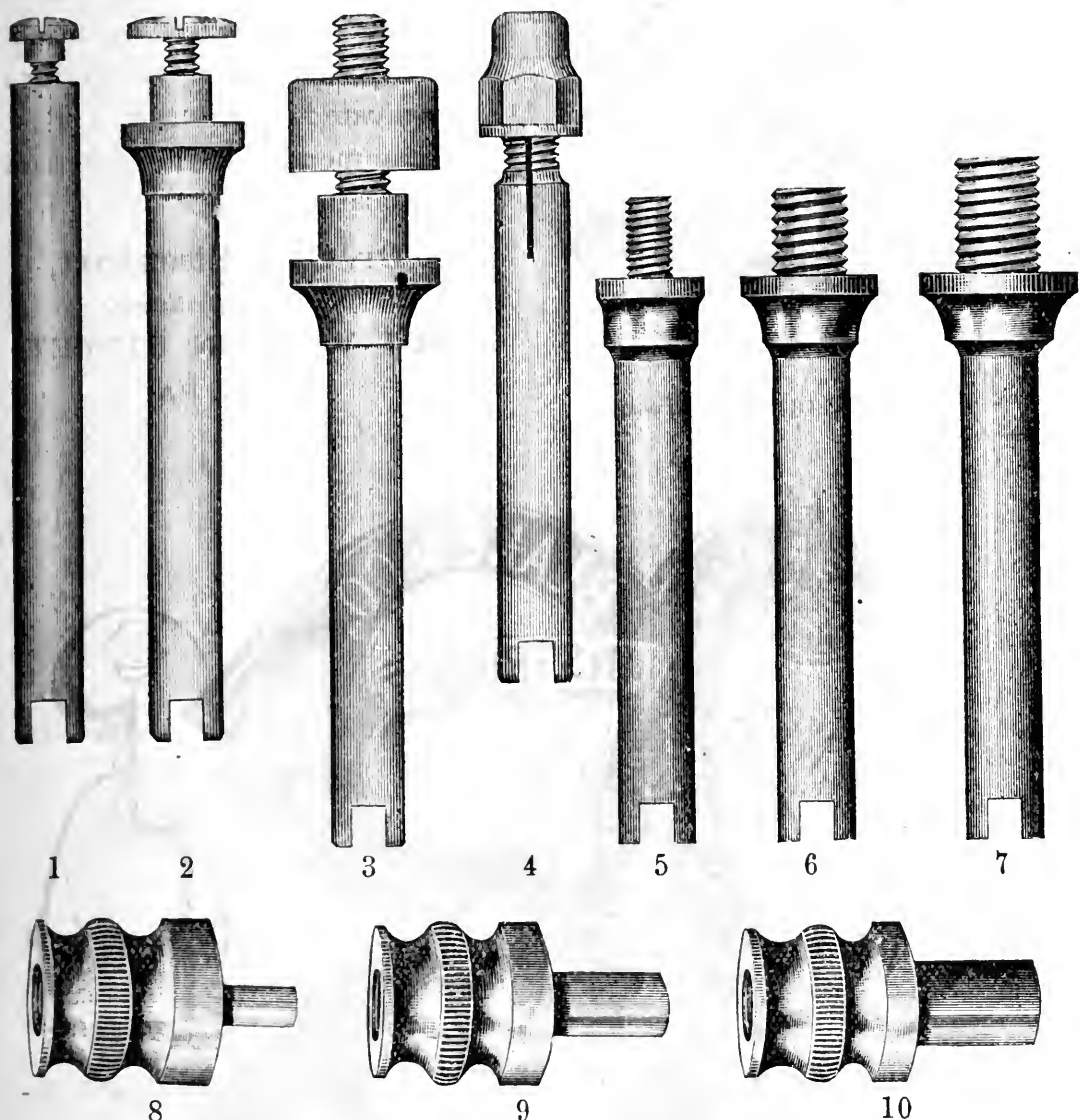


This Lathe Head, in connection with the Lawrence Driving Wheel, makes the most complete and satisfactory Dentist's Lathe in the market. It is the best article of the kind ever offered. The workmanship and materials used are of the very best quality. The bearings are accurately fitted and so arranged that any lost motion which may occur by wear can be taken up with rapidity and accuracy. It is finished with a cone screw on one end and a split chuck upon the other. The chuck is made with a cross-pin at the rear end, which is grasped by the split ends of the mandrels, thus giving them very long bearings. The oil-holes are covered with handsome metal screw caps. The spindle and pulley-wheel are highly finished and the frame-work Japanned. Ten chucks are supplied with the lathe, if desired.

PRICE.

Head complete, with ten chucks,	-	-	-	\$11 00
Head, without chucks,	-	-	-	8 00

CHUCKS FOR LATHE HEAD NO. 4.

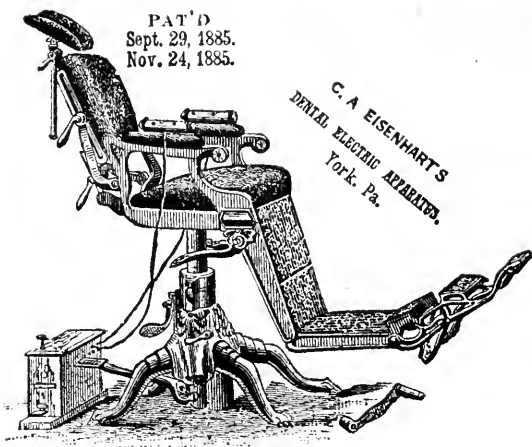


Nos. 1, 2 and 3 are screw chucks for corundum wheels, &c. No. 4 will carry engine burs, drills and tools. Nos. 5, 6 and 7 are screw mandrels for the improved metal-centre corundum wheels. Nos. 8, 9 and 10 are brass chucks fitting upon No. 7, and are intended for shellacking corundum wheels on.

PRICE.

Set of ten Chucks, -	-	-	-	-	-	-	\$4 00
No. 1, - - -	\$ 30	No. 5, - - -	-	-	-	-	35
No. 2, - - -	45	No. 6, - - -	-	-	-	-	40
No. 3, - - -	60	No. 7, - - -	-	-	-	-	45
No. 4, - - -	1 00	No. 8, 9, 10, each, -	-	-	-	-	25

A set of Chucks to accompany Improved Lathe No. 1. Lathe Head No. 1 and Socket Lathe Head, consists of Nos. 5, 6, 7, 8, 9, 10. Illustrated above.



Oct. '87. PRICE COMPLETE, \$40.

AN ULTIMATE TRIUMPH.

Teeth extracted by Electricity, and sensitive cavities excavated with ease. Best recommendations furnished on application to

Dr. C. A. Eisenhart,

Patentee and Manufacturer,

307 W. MAIN STREET,

YORK, PA.



Jan. '88.

MERCURY

Chemically Pure.

Try it. You will use no other.

1-4 lb. Bottle, 40 Cents.

Absorbent Cotton.

A SUPERIOR ARTICLE.

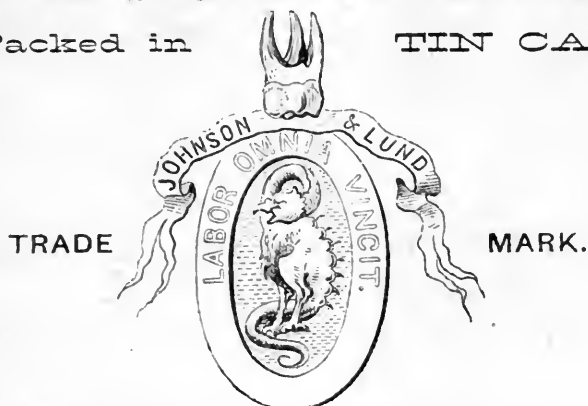
NONE BETTER.

One Ounce, 12 cts. Two Ounces, 20 cts.

1-2 POUND, \$1.50.
EXTRA TOUGH
COFFER-DAM RUBBER,

Packed in

TIN CANS.



Manufactured Expressly for

JOHNSON & LUND,

620 RACE STREET, Phila.

514 WABASH AVENUE, Chicago, Ills.

We take pleasure in calling the attention of the Profession to a new article of Rubber-Dam, made in the most careful manner of the best Para Rubber, no adulterations being used in the manufacture, the Dam consisting entirely of Rubber, sufficient of sulphur only being used to properly vulcanize it. It is cut in strips $8\frac{1}{2}$ inches wide and from $3\frac{1}{2}$ to 4 yards long, being a very handy size for general use, it is packed in METAL TUBES with a MOVABLE LID made as nearly AIR TIGHT as possible, in which the Dam can be kept, thus assisting very materially in preserving the strength of the material. At present we are only packing the medium weight in this manner, but will soon be able to offer the thin and medium thick weights for sale.

PRICE, per Can \$1.50.

Sent postage free on receipt of price.

A BARGAIN!

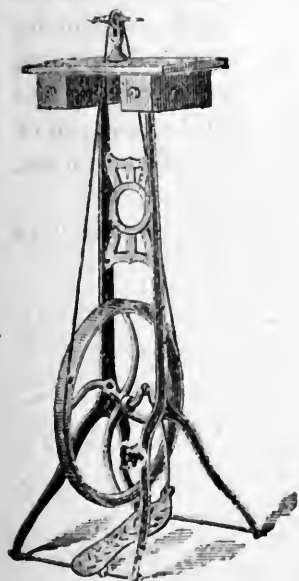
We offer for sale six Upright Dental Lathes, perfectly new; Howe pattern; driving-wheel 17-inch diameter; iron frame; walnut-table, with two drawers.

Price (not boxed,) each \$8.00.

Boxing, 75 cents extra.

JOHNSON & LUND,

No. 620 RACE STREET, PHILADELPHIA.



EMERY STRIPS.

For Cutting Down and Polishing Fillings.

These strips are put up in the following grades: { No. F. F., the Finest, No. O. O.
 { No. O, Medium No. 100.
 { No. 1-2, the Coarsest, Assorted some of all grades } **PRICE**
50 Cents per GROSS.

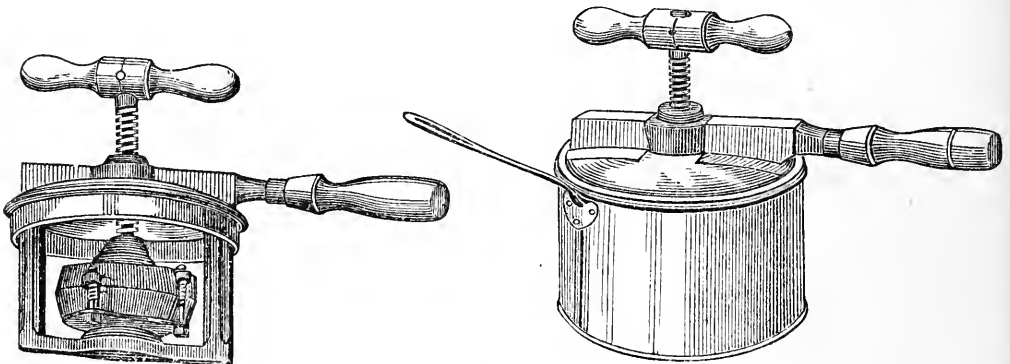
FOR SALE.

An old established office, good run of business, in a New York State City of over 50,000 inhabitants. Moderate rent; two chairs, and all other necessities for business. Owner compelled to quit practice. \$300 for the whole.

Address D. D. S.,
Care of JOHNSON & LUND,
620 Race Street, Philadelphia.

DR. M. LUKENS LONG'S FLASK, PRESS AND BOILER COMBINED.

FOR CLOSING FLASKS AFTER PACKING.



B.

A.

The handles of the Press are wood, and therefore can be used without heating the hands; no matter how hot the iron may be. The Press is permanently attached to the lid of the boiler. After the case is packed it is placed in the Press, and both are immersed in the water in the boiler. The water is then raised to the boiling point, which softens the rubber so that it can be gradually forced by means of the Press, into its proper place. One great advantage this apparatus possesses is, that the flask can be LIFTED FROM THE BOILING WATER WHILE IN THE PRESS, so that the operator can see, from time to time, how his work progresses.

Cut B shows the machine complete. Cut A shows the Press with a flask in it, as it appears when out of the boiler.

Price, complete, \$3.00.

DENTAL FLOSS SILK.

Price, plain, per dozen,90	Price, waxed, per dozen, \$1.15
" " " spool,15	" " " spool, .15

JOHNSON & LUND, Philadelphia and Chicago.

Spunk, for Drying out Cavities.

Price, per ounce,20 | Price, in bulk, per lb., . \$2.25

Orange Wood, for Wedging.

Per bundle, 10 cents.

PATTERN METAL.

This metal is composed of Lead and Tin, the body being lead and the surfaces Pure Tin. No matter how thin the Pattern Metal is rolled, it still maintains a pure tin surface, and is therefore quite equal to the more expensive metal for the above purpose.

Price per pound, \$.35

AIR-CHAMBER METAL.

Composed of Lead and Tin, the same as the Pattern Metal, only thicker.

Price per pound, \$.35

PURE TIN METAL

for Air-Chambers and Pattern Metal.

Price per pound, \$.75

METALLIC AIR-CHAMBER PATTERNS.

A



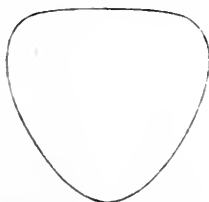
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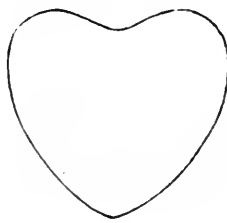
(Our Own Make.)



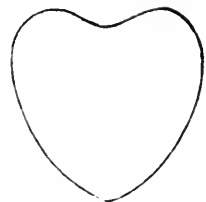
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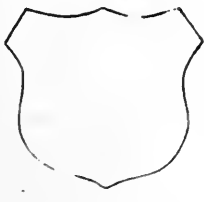
3.



4.



5.



6.

We present six forms of patterns; they are cut out of two thicknesses of metal, represented by designs A and B; the composition of which they are made WILL NOT BLACKEN THE RUBBER. This feature is a decided improvement upon those metallic patterns before in use. They are made in the best manner, by improved machinery, and care has been taken to avoid all sharp angles. Both sides of each pattern are alike.

Thin, per dozen, \$.20
Thick, "25

REDUCTION IN PRICE.

LAVA STRIPS.

→* *For Finishing Fillings, Tough and Strong.* *←

ONE GROSS STRIPS IN A BOX.

Price per box, . (former price 50 cents) . now 30 cents.

✧ Steurer's Plastic Gold. ✧



We respectfully call attention to a new form of **Dental Gold**, that we have introduced to the profession under the name of "STEURER'S PLASTIC GOLD."

It is a chemically pure Gold in a plastic state, without admixture of any foreign substance, of a brown color and homogeneous appearance.

We claim the following advantages over all other forms of Gold heretofore used:—

1st. It is more cohesive.

2nd. It has a spreading quality before it is completely condensed, so that it can be moulded into any cavity.

3rd. A tooth can be filled in one-third of the time it takes with any other Gold, simple hand pressure being sufficient to make a solid filling, the mallet (which is so disagreeable to most patients) can be dispensed with, and so sensitive teeth, or those whose walls are frail, can be easily filled.

4th. No retaining points are needed—simple undercuts are sufficient—so that very often the natural cavity, after the decay has been removed, has sufficient undercut to retain this form of Gold.

5th. Being absolutely pure Gold, it retains its color.

6th. It can be used a long time if properly taken care of without annealing.

DIRECTIONS FOR USE.

Take a piece of gold about the width of the cavity and gently knead it in with a large instrument (as if it were putty) by pressing it from the centre well up against the walls of the cavity. When somewhat compact, work it over with a smaller instrument until all the brown particles disappear and it has a bright frosted surface.

Add another piece by first making firm pressure with the instrument so as to make it adhere to the condensed piece at one point, and then gently knead the rest into the cavity, and then as before press it until it becomes frosted.

Use large broad points with slight serrations. Amalgam carriers and files make good instruments to knead it into the cavity. When the cavity is slightly overfilled, then burnish down, being careful to overlap the edges. Finish with file, etc., as usual.

Being chemically pure Gold, without admixture of any foreign substances, it will hold its color. If by the lapse of time it should lose any of its cohesiveness, you simply heat it upon a thin sheet of mica over an alcohol lamp. Do not use too large pieces, and pick them up from a hard surface, such as a piece of stiff paper. By keeping it in the bottle it can be kept for a long time without annealing.

Beware of worthless imitations. Be careful to see that it is in the shape of small square pieces, packed in bottles, and labeled *Steurer's Plastic Gold*, because the imitations, although they may apparently work tolerably in the commencement, do not make a solid filling, but gradually crumble away.

AS WE HAVE TO PAY CASH FOR THE GOLD AND THE MARGIN
IS SO SMALL, WE MUST SELL FOR CASH ONLY.
PLEASE SEND CASH WITH ORDER.

Price Per Bottle, 1-16 oz., \$2.50. Sent postage free on receipt of price.

JOHNSON & LUND.

DENTAL DEPOTS,

620 Race Street, Philadelphia.

514 Wabash Avenue, Chicago.

THE
Dental Office and Laboratory.
THIRD SERIES.

VOL. 1.

PHILADELPHIA, JULY, 1887.

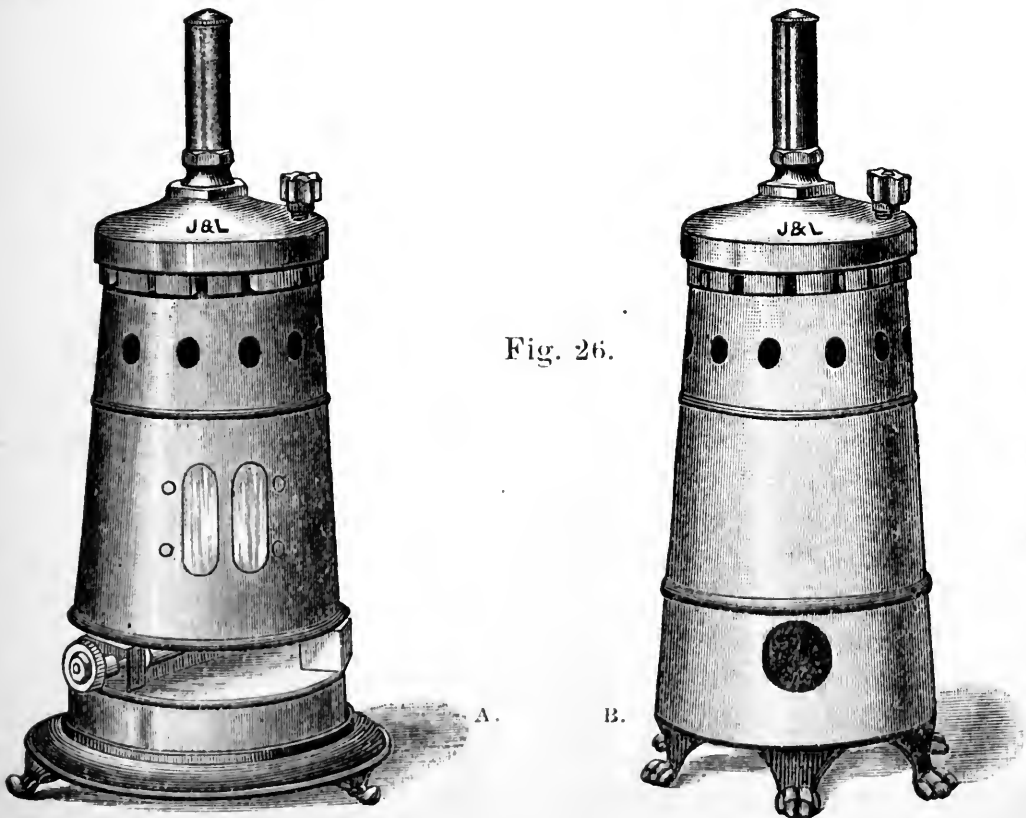
No. 3.

VULCANITE WORK.

By DR. THEO. F. CHUPEIN,

Continued from page 34, Vol. 1, No. 2.

The case being now packed with rubber is ready for the vulcanizing process. This consists in changing the rubber from a soft to a hard substance and is the discovery of Nelson Goodyear. He found that if pure rubber were mixed in certain proportions with sulphur and then subjected to a certain degree of heat in an air-tight vessel, the rubber was changed from a soft to a hard substance. The instrument used for this purpose is called a Vulcanizer, and is illustrated at Fig. 26.



In the illustrations set forth, one vulcanizer, letter A, is heated by means of a coal oil stove, the jacket or outer covering being set on the stove. The other, letter B, the heat is derived from illuminating gas—the jacket, covering a Lunsen burner which furnishes the heat. This last is by far the best, where gas is available—being cleaner, more regular and more prompt in its working.

Fig. 27 represents the pot and cover set into a bed-plate for the convenient use of screwing it down tightly. The pot consists of a very strong vessel made of sheet copper, brazed so as to withstand both heat and great steam pressure. At its mouth or orifice it is furnished with a strong screw-thread to which the top (which is made of brass and supplied with a thermometer to register the degree of heat) is secured. To vulcanize a case the flask, which has been packed as described, is put into the pot and partly filled with water. The top, or cover, is then screwed down securely to the pot and set over the burner

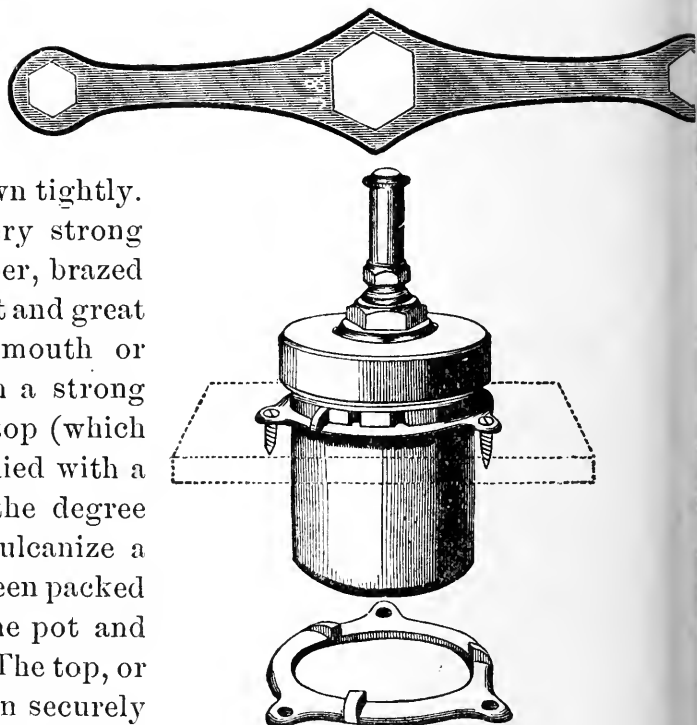


Fig. 27.

to be heated. The heat is permitted to continue until the mercury in the tube of the thermometer marks 320° degrees on the scale. At this point it is kept from rising any higher by diminishing the heat, and the temperature is kept at such a point that the mercury is retained at this point, not being permitted to rise higher or fall lower than 320° degrees, for 55 or 60 minutes. After the expiration of this time the gas is shut off (if gas is used), or the burner extinguished (if coal oil is used) and the vulcanizer is permitted to cool down. If, however, the case is hurried it may be cooled down rapidly by lifting the pot out of the jacket and setting it in a basin of water to accelerate the cooling. When the mercury in the thermometer has fallen, by this cooling, so as to mark 200° degrees of heat, the top may be unscrewed and the flask removed. The flask, however, should not be opened until it is perfectly cold, as well as the plaster investment within. This being accomplished, the nuts on the bolts of the flask may be unscrewed, and the plaster investment cut away, and the set of teeth cleaned of all adhering plaster, by means of stiff brushes used with water. Fig. 28.

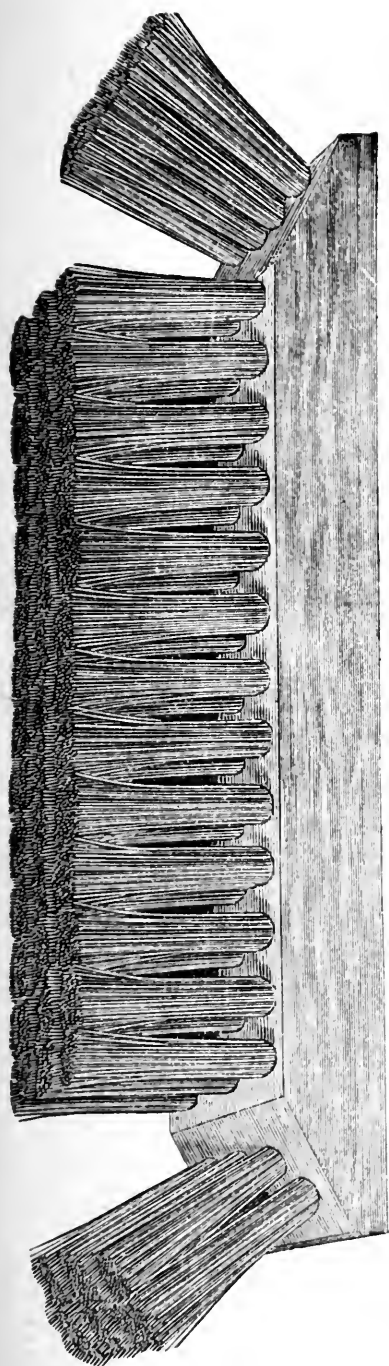


Fig. 28

It has been observed that rubber, or vulcanite, as it is also called, is better cured or cooked if during the process of vulcanizing it is *kept out of water*. For this purpose it has been our practice to place in the bottom of the pot, the ring of an old flask, or indeed anything of the kind that will keep the flask, containing the work, out of the water. Only so much water (less than a half pint) should be put into the pot, as will barely come to the top of the ring placed in the bottom of the vulcanizer for this purpose, and on this ring the flask should be placed and the operation of vulcanizing proceeded with as has been described. For this reason we would recommend the purchase of what is known as a 3-case vulcanizer; for with one of this size two cases can be vulcanized at the same time, and both flasks kept out of the water by the means we have suggested. A very convenient device to have in the laboratory, to aid the memory with, is a "dumb clock." This may be made of a piece of card board and figured like the face of a clock, with the two hands working independently of each other by being rivetted to the card board. Its use will be as follows:



Fig. 29

Suppose the mercury in the thermometer of the vulcanizer has risen to the point 320° degrees, at a *quarter past 9 o'clock*. You will then turn the hands on the dumb-clock so they will mark a *quarter past 10 o'clock*, for at that time you will know that the heat is to be shut off. This is only suggested as a little convenience, to aid to memory.

The case being removed from the flask and investment, as described is filed into shape with what is known as vulcanite files. Fig. 29.

FIG. 30

HALF ROUND FILE C.

This form—of which several sizes are made—being the most generally useful. For cutting down the concave or palatine surface of the plate, the different forms of lathe burs represented at Fig. 30.

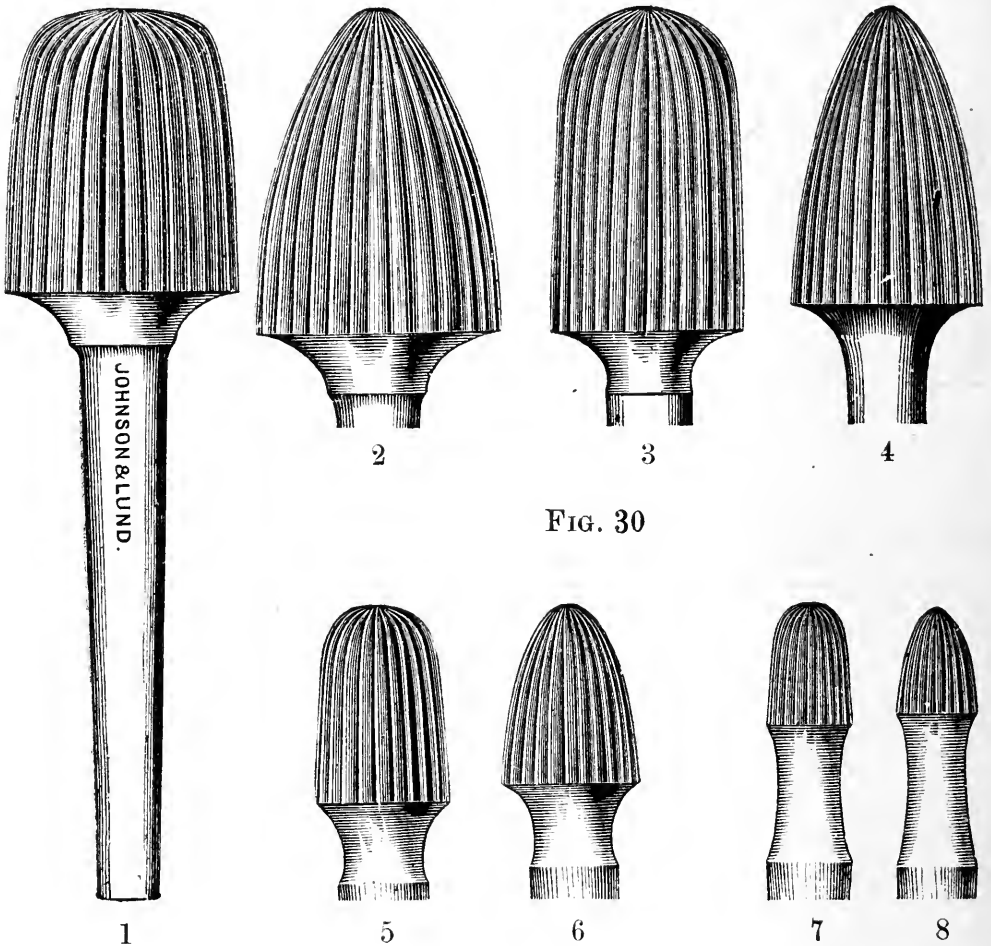


FIG. 30

will be found very convenient. As these, however, are injured or made dull by contact, during their revolution on the lathe, with the porcelain teeth, the finishers represented at Fig. 31

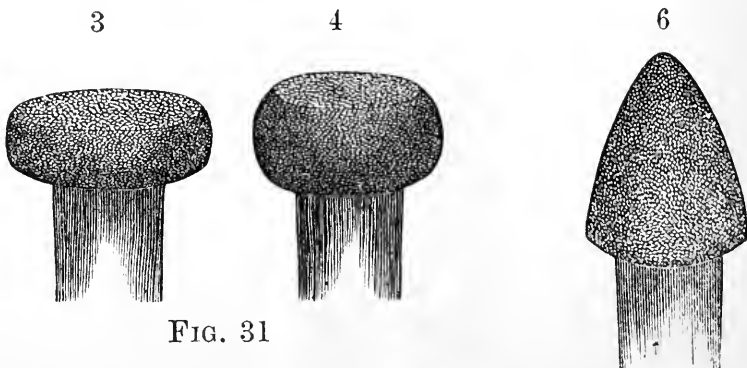
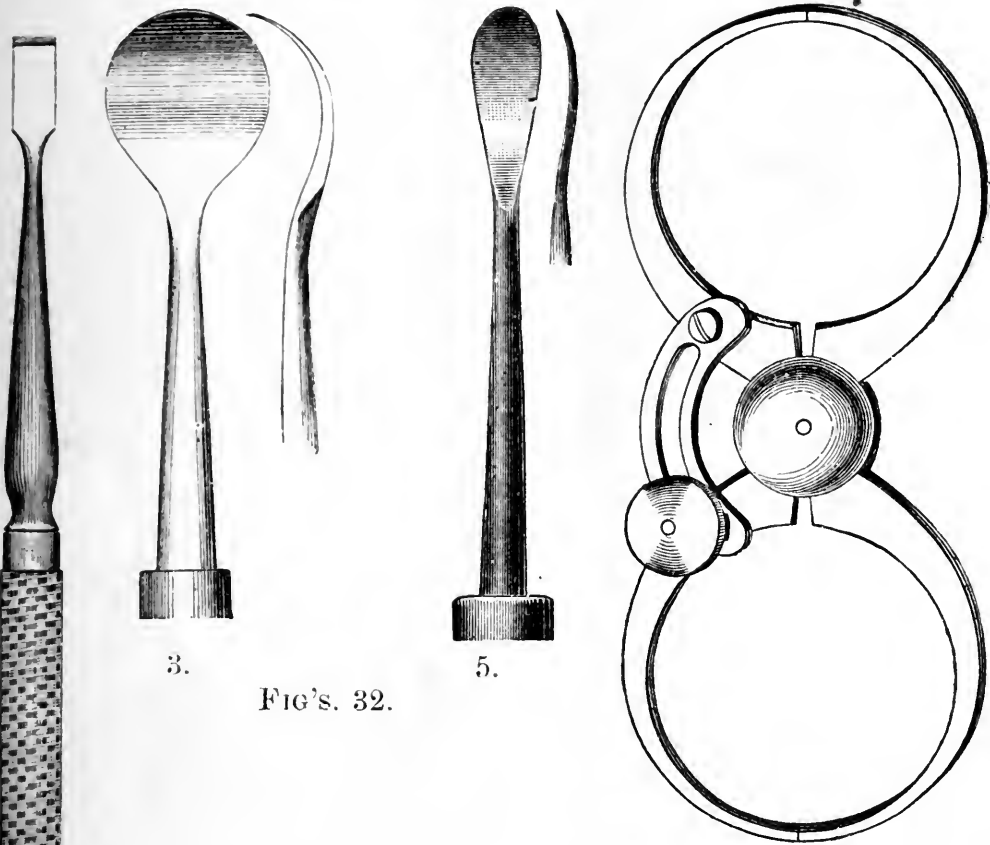


FIG. 31

will be found also very serviceable for this purpose. The forms 3, 4

and 6 will be found the most useful. All the excessive roughness of the plate being partially reduced by these appliances, it is further reduced in bulk and thickness by the use of vulcanite scrapers, Fig. 32.



FIG's. 32.

FIG. 33.

These two sizes and forms being the most useful, it is necessary to caution the operator during the progress of this reduction of the thickness of the plate, for fear it may be made too thin or that he cut through the plate into the air-chamber. For this purpose it is well that he provide himself, with a pair of calipers, FIG. 33.

With this instrument, the thickness or thinness of the plate may always be determined. The points of the instrument are opened and passed on the upper and under surfaces of the plate, and then pressed together. By examining the opposite points of the instruments, the thickness of the plate at any point is determined. The outer rim of the plate is reduced with the flat side of the vulcanite file, and all jagged edges of rubber which lie next to the porcelain facing representing the gum, be cut clean and smooth with an enamel chisel, such as is used for

Fig. 34 operating on the teeth, FIG. 34.



FIG. 35.

Or the two instruments (Fig. 35) will be found very serviceable for cutting away the rubber that adheres to the teeth on the palatine surface of the plate.

The plate having been filed into shape and reduced in thickness with the lathe-brush and scrapers, it is made smooth of all file marks with sand-paper. When this is done it is rendered still smoother by the use of cork or felt wheels, used with finely powdered pumice stone and water, driven or revolved on the polishing lathe (see Fig. 16 of this article). When every scratch or blemish is thus removed, whitening mixed with water is used on the plate, to obtain the final polish. This is used with the wheel-brush on the polishing lathe, Fig. 36,

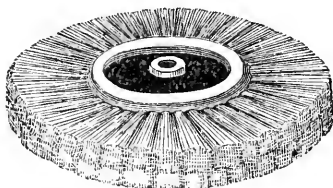


FIG. 36.

made of fine, soft bristles, is the best size for the purpose—it is known as No. 18, soft bristles, 3 rows and 2 inches in diameter. In using the brush-wheel for polishing, the lathe should be revolved at a high rate of speed. A suggestion has been recently made in one of the English journals relative to the final polishing of rubber plates, for which we can vouch as to its efficacy. After the plate has been made perfectly smooth and free of all scratches by the cork or felt-wheels and powdered pumice stone, it is scrubbed perfectly clean with a brush, soap and water, and then dried. A drop or two of oil (no more) is placed on the palatal surface of the plate, the plate being held in the left hand. A teaspoonful of fine, dry plaster-of-Paris is now put over the oil and this is rubbed with the thumb of the right hand for a minute or two. The rim is treated in the same way, only that the forefinger of the right hand is used as the polishing implement. A beautiful polish may be obtained in this way. The case is again washed with soap and water, with a soft brush like that represented by Fig. 37.

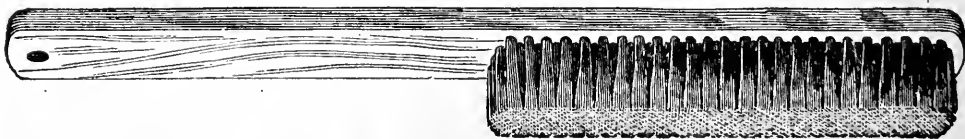


FIG. 37.

Should it be determined to make the case of celluloid instead of vulcanite, the manipulation will be precisely the same up to the time of flasking. A celluloid flask differs from a vulcanite flask in the former having very much longer guide pins and in having no bolts. The case is invested in the celluloid flask in precisely the same way as has been described for flasking the case when vulcanite is to be used. No salt, however, is mixed with this plaster for investment. The parts of the flask are separated in the same way, but the wax is not saved, as was the case when rubber was used. The wax being all cleaned away by the use of boiling water poured into the flask—a celluloid blank of suitable size is selected. This is fitted to the case as nearly as possible; the part of the flask having the teeth imbedded in it being below, the blank is placed into this and finally the part of the flask having the model is set on to these last, and held into place by its long guide pins. The flask is now set into the celluloid press, which is illustrated at Fig. 38.

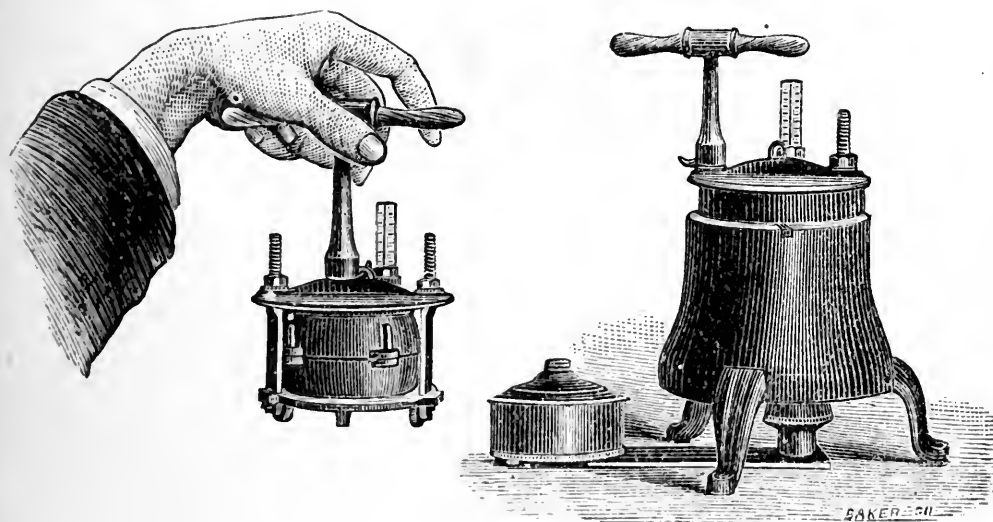


FIG. 38.

The heat is now applied and when the mercury in the thermometer—with which the machine is provided—marks 250 degrees of heat the case may be screwed down tight, applying the pressure of the screw little by little. It is only necessary to let the case get *perfectly cold*, when it is cut out of the flask, cleaned of all adhering plaster and finished up in the same way as has been described to finish up a rubber case.

We have thus advanced in our instruction in vulcanite work from the taking of the impression to the final completion of the case.

This instruction has been simply for an upper set. We propose now to go over the ground of how an entire set—upper and lower—is constructed. But as the manipulation of making the model, grinding and mounting the teeth on wax—waxing the case—flasking, packing, vulcanizing and finishing for the lower jaw, being precisely the

same as what has been described for the upper jaw, it will not be necessary to repeat these processes.

TAKING AN IMPRESSION OF THE LOWER JAW.



FIG. 39.

To take an impression of the lower jaw, where no teeth remain, an impression-cup, such as is shown at Fig. 39, will be necessary, the same being of proper size. Impression-plaster is placed into the cup and this is carried into the mouth, the operator holding the cup by the handle and standing to the right and slightly in front of the patient. When the cup and plaster in it is brought to its position over the ridge of the jaw before settling it down on the gums, the patient is directed to raise the point of the tongue to the roof of the mouth. This is made necessary in order to obtain an impression of the gums which lie far back in the mouth towards the throat, and which is often obliterated or

rendered imperfect by the mass of integuments about the root of the tongue. Indeed this part of the gum of the lower jaw is frequently difficult to take, especially for old persons where there is an excessive absorption of these parts. The cup has frequently to be bent or altered in shape at these points, and even this at times fails to afford a remedy. The most successful plan we have found for such cases is to fill the cup with modeling composition and when this is pressed on the gum, the cup is held down with one hand, and, before the material gets hard we introduce the finger into the mouth and press the material against the gum at these points. The material thus manipulated is kept in place until it is hard enough to remove from the mouth without bending. It is then immersed in cold water until it is quite hard. When hard it is cut and trimmed, with a pen-knife, to its smallest dimensions, so as not to interfere with its re-introduction into the mouth. It is then dug out to the depth of an eighth of an inch, in the same way as was done for the case of a high arch, as illustrated at Fig. 2 of a former paper, on the inner or concave surface, in the places all over the ridge where the plate is to rest, and this is scored or undercut to prevent the plaster from leaving it when it is withdrawn from the mouth. Impression plaster is then mixed and placed into this prepared receptacle. The cup is again put into the mouth and settled into its position over the gums. When the plaster hardens it is removed from the mouth and the model made as has already been described.

The models being made for both jaws, for an entire denture, base plates are moulded on them, as already described. The base plate for the lower jaw being so very narrow and without strength, (when made of base plate wax) should be strengthened by bending a piece of iron wire in the shape of a horse-shoe, (or approximate to the shape of the case in hand,) heating this, and while hot laying it on the wax base plate, in which it imbeds itself from its temperature; this will materially strengthen it. Articulating wax is now placed on both upper and lower base plates and trimmed into shape. Fig. 40.

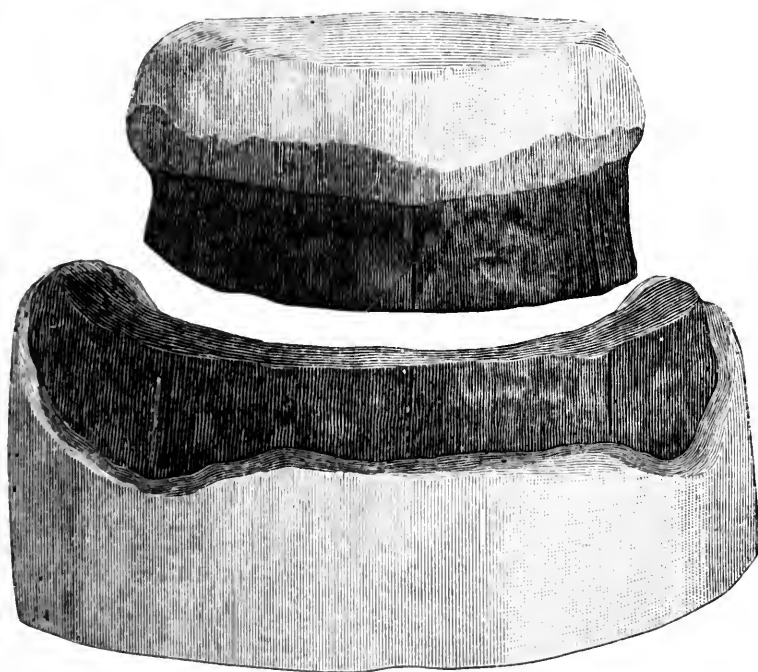


FIG. 40.

represents the articulating wax placed on the base plates as has been described.

TAKING THE BITE FOR AN ENTIRE DENTURE.

The base plates with the articulating wax on them being thus prepared, they are placed in the patient's mouth and settled into place. The patient is directed to close the jaws on the wax, having moistened the masticating surfaces of the same with the tongue to prevent them from adhering. The lips are then drawn back and the articulating surfaces of the wax examined where they touch, and are marked. The plates are removed from the mouth and these points are cut away.

They are again inserted in the mouth and the same examination and marking made and corrected as before. This is repeated until the masticating surfaces of the wax touch evenly all around. The wax is also to be dressed off or added to, to restore all fullness and depressions. These being all accomplished, three marks are made on the articulating wax running from the upper to the lower base plates. One mark at the median line and one on each side in the neighborhood of where the 1st or 2d bicusped tooth would be. This being done the patient is engaged in conversation and told to close the jaws, not too hard, on the articulating wax. After repeated trials in this way, if the marks on the wax are found to come *always in the same place*, on the jaws being closed, it is fair to presume that the correct bite has been obtained. This being accomplished, three little pieces of iron wire are bent like staples. Fig. 41.



FIG 41. These are held, one at a time, between the points of the tweezers in the blaze of the spirit-lamps and when thus heated they are pushed into the upper and lower articulating wax, one half into each, the lips being held out of the way. One of these little staples is placed at the median line, the other two at any point, on each side, in the neighborhood of where the bicusped teeth would be.

FIG. 42.

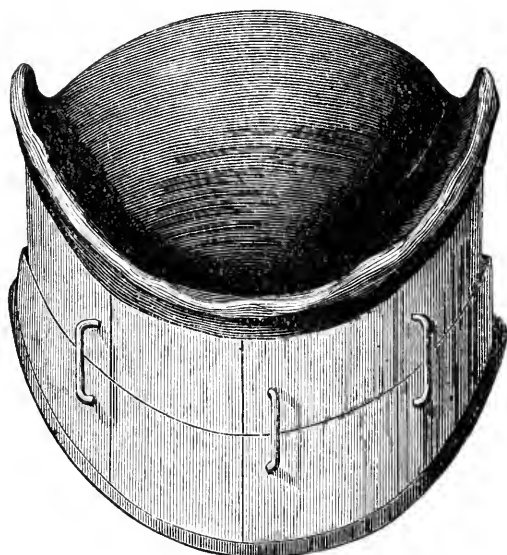


FIG. 42.

The upper and lower plates being thus fastened together the patient is directed to push the plates out of the mouth with the tongue. Fig. 43. represents the upper and lower plates, thus united.

The upper and lower models are now put into their base plates, and these are secured into the articulator in the manner described for doing this when simply an upper denture was being made.

The mounting of the teeth for a lower case is precisely the same as the mounting for an

upper. The articulating of the teeth, for an upper and lower denture requires more care and nicety of manipulation than when simply one or the other is under construction; but the operation is not attended

with very great difficulty. We find it preferable, in entire cases, to mount the lower teeth first, and then antagonize the other to them..

When the teeth are all mounted in wax, they are tried into the patient's mouth, and any alteration found necessary in the position of the teeth is corrected. The plates are then removed from the mouth, and waxed as before described. In packing the low case, *weighted rubber* is sometimes used to give greater stability, by weight, to this denture, which only depends, in many cases on its weight, or on the knack of the patient to keep it in place. Sometimes instead of weighted rubber the case is *loaded* by placing or imbedding in the rubber small pieces of thick pure tin plate. This however is not so good as when weighted rubber is used, as frequently pieces of the thick tin plate crops out on the outside of the plate and make a blemish on the mark.

The tin foil which was put on the upper model, to prevent the rubber from adhering to the plaster, is removed by immersing the case in a solution of nitric acid and water, in the proportion of one part of acid to two of water. This leaves the plate perfectly clean and smooth.

To be Continued.

THE TEETH OF THE APACHE INDIANS, says Dr. Corbusier, are often decayed but not affected with tartar. These Indians do not maintain their stolidity under minor surgical operations, the extraction of a tooth almost always eliciting a groan or a yell.—*N. Y. Med. Journal.*

THE FATHER OF HIS COUNTRY suffered from bad teeth as may be inferred from the following letter to a firm of commission merchants in London: "Dear Cary," he wrote to the senior member of the firm, "Mrs. Washington joins me in warm thanks to you for your considerate present of two large stone jars of pickled tripe. I must ask you to arrange for four similar jars, in wicker basket casing, packed in outer casks, to be shipped for my account direct from the owners. Dental infirmity impels my caring for this necessary item in our domestic commissariat."—*Youth's Companion.*

"CERTAIN OF NOTHING."—The great teacher of evolution in Germany, Virchow, pursued the subject till he found it had no positive proof, and then candidly pronounced it "an unverified hypothesis." Haeckel, now the champion of that dogma, and himself formerly a pupil of Virchow, rose up against his teacher, and in the excess of his mortification at the defection of his master, he declared that the same is true of all science—that we are certain of nothing—that all knowledge is good enough till something more conclusive and satisfying is *supposed* to be true, and then we accept the new and reject the old. What a field of inquiry does this bold assertion of Haeckel open to the young student's mind!—*N. Y. Observer.*

PRACTICAL PLACE.

TANNIN FOR INGROWING TOE-NAIL.—A concentrated solution (an ounce of perfectly fresh tannic acid dissolved in six drachms of pure water, with a gentle heat) must be painted on the soft parts twice a day. Two cases recently had no pain nor lameness after the first application, and went about their work immediately, which they could not do before. After about three weeks of this treatment, the nail had grown to its proper length and breadth, and the cure was complete. No other treatment of any kind was used, though formerly I introduced lint under the ingrowing edge in such cases.—*British Medical Journal*.

TIT FOR TAT.—One Day a Man cum into the Bosses Offis, and says he, mister, I am A Stranger which cum A hundred 50 Miles To Get sum Teeth filled; can you do it right Away? the Boss he Thot a Minit and says he, No I'm afeard Not; I've got A all-Day appointment With judge perkinsis Wife. so The Man went of, and after a While the Boss he Got tired Waiting for miss perkins to cum, so he Went and Cleaned out the Seller and Shuvelde Cole all day. Late that Evnin Dr. Jones cum in Smokin a 15 sent sigar, and he Slapped the Boss on the Sholder, and says he, hello, sanders, you dun me A good turn Wen you Sent that Stranger over To my Offis this a. m. I Dun Forty-4 dolers an' 50c. worth Spot Cash fur him. The Boss looked Kind o' dazed fur a Minit, and after a Bit he remarked That he be Dam if he Ever had A Bit of Luck. One day About a Weak later miss perkins cum saling in Just as Me and the boss was trying to put a Clamp on the wisdom Tooth in a Sucker's mouth, and Says, she, doctor, I'm Ol Reddy; Kin you Wait on me rite Away? I Seen he was Mad, but he Smiled kind o'pleasant, an' says He, cum in After diner an' yu'll find The chair unoccupied. she Went of, Looking like she Thot that Wasn't the way She was Expectin' to be Treated. After diner she Cum in an' says kind o' commandin'; Wher's The dentist? an' says I, he's gone Fishin'. Gone Fishin' Gone Fishin'? says she turnin' red. Yes, says I; he'll be back 'bout crismus. Says she, you Tell him i've Gone to Another dentist wot's More punchul. He'll never Do no more Work fur Our family. So There!

[This fable teaches us that when you are not quite certain about the temper of your metal, it is not a bad plan to keep several irons in the fire.] *The Cincinnati Medical and Dental Journal*.

A NEW COLLODION.—A new film-producing material which is said to possess many advantages over the time-honored solution of gun cotton in ether, is made, according to a writer in the *Union Pharmacie*, by mixing 3 parts of gum mastic, in powder, and 1 part of balsam of Peru, dry, and dissolving the whole in 5 parts of Chloroform. When an analgesic effect is desired one part of narcotine may be added to the gums and dissolved with them in the chloroform. Silk or linen cloths may be soaked in the mixture and dried and afterwards used as court-plaster.

NEW LOCAL ANESTHETIC.—A crystalline substance has been obtained in minute quantities from the rind of pomegranates, which when placed on the tongue or other portions of the mucous membrane, paralyzes local sensation after the manner of cocaine.

HOW TO CURE WARTS.—Place the thumb upon the wart, and press it against the bone. Move the wart back and forth upon the bone until the roots become irritated or sore, when the wart will disappear. I have had quite a number upon my hands, and have got rid of all of them in the above manner.

THE Senate of Pennsylvania has passed a bill providing for the infliction of capital punishment by electricity. If we are not mistaken, it was the *Scientific American* that first advanced the idea of applying electricity for executions, and it was not long after our publication that two or more patents were issued for chairs provided with wires for the purpose.

ARTIFICIAL WHETSTONES.—The *Guide Scientifique* describes the following method of making artificial whetstones. Gelatine of good quality is dissolved in its own weight of water, the operation being conducted in a dark room. To the solution $1\frac{1}{2}$ per cent. of bichromate of potash is added, which has previously been dissolved in a little water. A quantity of very fine emery, equal to nine times the weight of the gelatine, is intimately mixed with the gelatine solution. Pulverized flint may be substituted for emery. The mass is moulded into any desired shape, and is then consolidated by heavy pressure. It is dried by exposure to strong sunlight for several hours.

COCAINE NERVE PASTE.—Dr. Kirk employs the following formula for a preparation for devitalizing dental pulps composed as follows: R.—Acid. arsenios. pulv., cocainæ hydrochlorat, aa gr. xx; menthol cryst., gr. v; glycerini, q. s. to make a stiff paste. This paste he finds more reliable than the usual arsenious acid, morphine and creosote preparation, and to be free from any undesirable qualities.

TO ROUGHEN A SMOOTH BROACH.—*Items of Interest* suggests the barbs on the broach we buy occupy as much space as the broach itself, so that it will not enter many of the delicate root canals. Take an untempered, smooth broach, or form one from fine piano wire, and draw a sharp separating file lengthwise of the broach, which will assist to catch the pulp in the root canal. It is also good to hold cotton twisted around it.

TO BRONZE TIN AND TIN ALLOYS.—Tin, and tin alloys, after careful cleansing from oxide and grease, are handsomely and permanently bronzed if brushed over with a solution of one part of sulphate of copper (bluestone) and one part of sulphate of iron (copperas) in twenty parts of water. When this has dried, the surface should be brushed with a solution of one part of acetate of copper (verdigris) in acetic acid. After several applications and dryings of the last named, the surface is polished with a soft brush and bloodstone powder. The raised portions are then rubbed off with soft leather moistened with wax in turpentine, followed by a rubbing with dry leather.

WHAT ARE THE DUTIES OF A DENTIST ?—Dr. John H. Coyle, of Thomasville, Ga., says, in the *Archives of Dentistry*:

The arrest of caries by filling or otherwise,
Extracting teeth and controlling hemorrhage,
Regulating teeth,
Treating and filling root canals,
Treating odontalgia,
Prevention and cure of alveolar abscess,
Removal of salivary calculus and cleaning teeth,
Treating diseased gums,
Restoring lost teeth.

The above belongs to the work of the dentist. Anything beyond that belongs to the domain of the physician or the oral surgeon.

THE HAIRS OF OUR HEAD NUMBERED.—A German inquirer has, it is stated, taken four heads of hair, of equal weight, then proceeded to count the individual hairs. One (red) was found to contain 90,000 hairs; another (black), 108,000; a third (brown), had 109,000; and the fourth (blonde), 140,100

A CONVENIENT AND CERTAIN MODE FOR TEMPERING STEEL.—Mr. James A. Peck, of Brewsters, N. Y., mechanical engineer for the N. Y. Condensed Milk Co., gives us the following method discovered by

him, and which he uses with great success for tempering all kinds of tools, knives, razors, steel dies, and other implements.

Take a suitable quantity of muriatic acid; dissolve all the zinc the acid will take. Prepare a tempering bath composed of one part of the above zinc-acid and one part water. Heat the steel according to its hardness. If high or hard steel, heat until just red and then temper in the acid bath. If low steel, heat it as hot as you would to temper in water, then temper in an acid-bath. After immersing in the acid-bath, cool off in water. For lathe and planer tools draw no temper; but for other tools draw temper. Unlike water tempering, the colors that appear under this method give no clue to the hardness.

By this process, steel is readily hardened to any desired degree, and may be made to cut glass like a diamond. If desired, an acid-bath composed of two parts of muriatic acid and one part water may be used. Mr. Peck, however, prefers the zinc-acid as being more dense.

A prominent advantage of this method of tempering is the certainty of its results. It never fails to yield the temper required. It can be relied upon for every description of steel or tool.—*Scientific American*.

KEEPING LEMONS.—Professor Remington states that a solution of table salt about the density of sea water will be found effectual for their preservation for five or six weeks at a time; before the juice is expressed, the lemons are well washed with water.—*Am. Journal Pharmacy*.

Heat red or white gutta-percha upon a porcelain disk or slab until sufficiently soft to be kneaded full of zink fillings; this will make excellent temporary fillings.—*Archives of Dentistry*.

DR. BOWMAN MACLEOD says that plaster-of-Paris mixed with ordinary water will not only expand on setting, but warp; thus causing many imperfect models. To avoid this he advises mixing the plaster with water to which potash alum has been added, in the proportion of three or four ounces to the gallon, which will do away with the unequal expansion, and consequent warpage, of the plaster.

DR. J. S. CASSIDY: Aseptol covers a larger field than any of the substances of which it is formed. In regard to cocaine, if a good preparation is used it is always effective to a certain extent, but by taking 1 drachm of camphor and 1 drachm of chloral and adding $\frac{1}{2}$ ounce cocaine alkaloid and 2 drachms sulphuric ether, you get an obtundent that will act every time. A five per cent. aqueous solution is beneficial for swellings, such as those caused from abscessed teeth, etc.

LOCAL ANÆSTHETIC.—Dr. Kulp, of Davenport, Iowa, uses the following formula:—

Olei Caryophill.

Olei Cinnamom.

Chloroformi, in equal parts.

Apply with cotton upon the gums.

READY-MADE GLUE.—Dissolve 1 ounce best glue in 4 ounces acetic acid; add 1 ounce glycerine and 5 drops of nitric acid. This glue keeps well and is always ready for use.

DR. PIERRE'S DENTRIFICE.—In further reply to an inquiry in our last number, we give a formula for a preparation resembling this, which has been printed in the *Pharm. Rundschau*:

Ground star anise seed 6 oz.

Powdered cochineal $\frac{1}{2}$ dr.

Alcohol 3 pints.

Percolate the solids with the alcohol, and in the percolate dissolve:

Oil of star anise seed $1\frac{1}{2}$ fl. oz.

Oil of peppermint $\frac{1}{2}$ fl. oz.

Heliotropin 1 gr.

Let stand several weeks to ripen.

GLASS STOPPERS IN BOTTLES.—A. J. G., Grand Rapids, O., recommends smearing a little petrolatum on glass stoppers, to prevent them from becoming stuck in the necks of bottles.

SILVERING BRASS WITHOUT A BATTERY.—G. D. M., Sloan, Ia.—Try the following:

	Parts.
Nitrate of silver	80
Chloride of ammonium	40
Hyposulphite of sodium	160
Distilled water	36

Dissolve the nitrate in the water; then add the other salts. Finally, add to the solution a little finely-levigated whiting. Thoroughly clean the object before applying.

A similar solution is made from cyanide of silver, but is objectionable on account of its highly poisonous character, and consequent danger in handling.

LAKE ERIE DENTAL ASSOCIATION.

*Complete Proceedings of the Twenty-Fourth Annual Session, Held in Meadville,
May 3-5, 1887.*

The twenty-fourth annual meeting of the Lake Erie Dental Association convened at the Commercial Hotel, this city, commencing at 11:20 a. m., Tuesday, May 31, when the meeting was called to order by President Green who occupied the chair.

The following members answered present at the first roll call :

Drs. George Elliot, Cyrus See, Meadville; C. D. Elliot, Franklin; G. W. Green, New Castle; J. A. Todd, Titusville; W. E. Van Orsdalen, Sharon. During the day the following additional members arrived: T. H. Whiteside, Youngstown; H. C. Dunn, Meadville; E. R. Allen, Girard; J. H. Nelson, North East; W. B. Isenberg, Mercer; M. H. Fetzger, Greenville; D. D. Magill, Erie; E. M. Wolf, Oil City. The following visitors were also present: F. H. Abel, Erie; J. W. Lyder, Akron; W. C. Mason, Mercer; F. H. Heivly, Oil City; F. Herrick, Greenville.

On motion the order of business was so changed as to bring the President's address the first thing of the afternoon session.

After approving the minutes of the previous meeting, as read, the executive committee recommended that the hours of session be from 9 a. m. to 12 m.; and from 2 to 5. p. m. Adopted.

Request of Dr. H. L. Wilkins, of Waterford, for withdrawal card, granted.

AFTERNOON SESSION.

Meeting called to order at 2 p. m.

President Green delivered the annual address, in which he treated the association to a very able discourse on their duties to their profession, to society and to the association.

On motion visiting members were extended the courtesy of the floor.

Report of Drs. Heivly, Van Orsdalen and Green, delegates to the State Society, read.

Dr. D. C. Dunn read an interesting paper on "Care and Treatment of Deciduous Teeth." Discussion by Drs. Wolf, Abel and Heivly followed.

Dr. D. D. Magill, of Erie, followed with an interesting paper, which brought out a long discussion, participated in by several members. The subject, the "Pyorrhœa Alveolaris," and the time occupied in its discussion brought the session to the hour of adjournment.

In the evening the association went into a Committee of the Whole,

the discussion being of a general nature and not entered on the minutes as part of the proceedings.

SECOND DAY.

Minutes of previous session approved as read.

Drs. W. C. Mason, Mercer, and F. H. Abel, Erie, were elected to membership.

Request of Dr. E. R. Allen, Girard, to be allowed to retire from active membership and be placed on the honorary list, granted.

Motion of Dr. See to increase the salary of the Secretary to \$25 per year carried.

Dr. See stated that in Vol. 1, No. 3, of the *Dental Review*, published in Chicago, the following "query" was published :

"To the Editor of the *Dental Review*, Sir:—I wish some advice about the treatment of the antrum. I have a case where an abscess from the second bicuspid discharged with the antrum, and after the extraction of the root, pus continued to flow from the opening. What treatment should be adopted? D. D. S., Meadville, Pa."

Dr. See further stated that he had written to the *Dental Review*, asking for the name of the correspondent, if the communication was genuine, and if not genuine, that a statement be published in the next number stating that the query was not written by any one entitled to the degree D. D. S., residing in Meadville, Pa. A reply was received stating that the communication was not genuine, and that the editor declined to make any amends for the injustice done.

Dr. See asked that a committee of three be appointed to examine the publication and the correspondence between himself and Dr. A. W. Harland, the editor, on the subject, said committee to report by resolution or otherwise, as the question demands.

On motion of Dr. Heivly, the president appointed Drs. Wolf, D. D. Magill and Todd as said committee.

The topic, "Crown and Bridge Work," was spoken on by Dr. J. A. Todd, Titusville.

The Committee on Enforcement of Dental Laws reported that but one case of violation had come to their notice.

AFTERNOON SESSION.

Roll called and minutes of morning session approved as read.

The following was read :

We, your committee appointed to take into consideration the matter complained of by our fellow member, Cyrus See, D. D. S. of the publication in the *Dental Review*, in Vol. 1, No. 3, Page 165, and signed D. D. S., Meadville, Pa., find it was not a communication from any

one, but originated in the office of the *Dental Review*. We find the matter complained of, from the evidence presented, to be true; and therefore, we wish to offer the following:

WHEREAS, Dr. See feels aggrieved by said publication and has written to the editor of said journal, and the reply received from said editor is of so evasive and unsatisfactory a nature, that we deem it but justice to Dr. See and the profession at large, that the facts in this case be made public. Therefore,

Resolved, That the publication of the query in question was an act unprofessional toward a brother dentist, and beneath the dignity of respectable journalism, and that the secretary furnish a copy of this report to the dental journals for publication.

E. M. WOLF, }
D. D. MAGILL, } Com.
J. A. TODD. }

The Executive Committee, having examined the accounts of Dr. Allen, as treasurer, report to wit:

Received as per last report,	\$102 28
Paid as per vouchers (since burned) expense in full of litigation in case Dickson, of Sharon,	48 32
Balance on hand,	\$ 53 96

This amount is now in the hands of your Executive Committee.

Respectfully Submitted,

CYRUS SEE,
J. H. HEIVLY,
M. H. FETZGER,
M. B. NARAMORE,
Executive Committee.

Received and adopted.

Charges were preferred against Dr. F. H. Lawrence, of Erie, and the Secretary instructed to notify him to appear at the meeting of the association and show cause why he should not be expelled for breach of the code of ethics.

The following officers were elected:

Dr. Fetzger, President; Dr. Naramore, Vice President; Dr. Elliott, Secretary; Dr. Heivly, Treasurer. Board of Censors: Drs. Whitesides, Green and See. Delegate to State Society, Drs. See, Fetzger, Elliott, (C. D.) Abel and Dunn.

The following was adopted:

Resolved, That as our next meeting will be the quarter centennial of this association, a more general invitation be given to the profession to meet with us on that occasion.

Meadville was selected as the place for holding the next meeting.

Adjourned.

CLOSING SESSION, THURSDAY.

Meeting called to order at 9:30, roll called and minutes of previous meeting approved as read.

The subject of electricity, as applied to dentistry, was freely discussed and productive of numerous opinions, some being strong admirers of the electric mallet.

Dr. George Elliott read an interesting paper on "Constitutional Treatment of Teeth of Frail Structure." The article was very lucid, hence well received. In the general discussion that followed, Dr. F. H. Abel, Erie, spoke at some length and advocated the filling of such teeth, temporarily, with zinc phos; he also described cases in practice in which he had given constitutional treatment and from which he hoped for beneficial results.

Secretary's report of receipts and expenses, showing a balance of \$94 in the treasury, was read and approved.

The newly elected officers were introduced and installed into their several positions. Remarks were in order and the newly elected acquitted themselves in a manner highly pleasing to the members.

The president announced the following as the executive committee for the ensuing year: Drs. Cyrus See, George Elliott, F. Herrick, E. M. Wolf, F. H. Abel.

The executive committee reported the following as subjects and essayists for the next session:

Address of Welcome, George Elliott, Meadville.

President's Address, M. H. Fetzger, Greenville.

Anæsthetic Application of the Dental Art, W. E. Magill, Erie.

Discussion opened by J. A. Todd, Titusville.

Remedial agents and their Application in Dental Practice, W. E. Van Orsdalen, Sharon.

Discussion opened by E. M. Wolf, Oil City.

The practical Application of Crown and Bridge Work, F. H. Abel, Erie.

Discussion opened with clinic, by T. H. Whitesides, Youngstown.

The Matrix and its uses, G. W. Green, New Castle.

Discussion opened by J. H. Heivly, Oil City.

Enology of Dental Caries, W. C. Mason, Mercer.

Discussion opened by D. C. Dunn, Meadville.

Electricity as Applied to Dentistry. H. E. Dunn, Cochranton.

Discussion opened by F. Herrick, Greenville.

Incidents of Office Practice, Discussion General.

The committee also recommended a four days' session, which, with the balance of the report was adopted.

On motion the secretary was instructed to send each member of the association a paper containing a full copy of the proceedings of the meetings.

The following resolution was adopted :

Resolved, That the thanks of this association are heartily tendered to Mr. Martin, proprietor of the Commercial Hotel, and to the representatives of the press for the kindness and attention shown this association during this meeting.

There being no further business, the meeting adjourned *sine die*, and thus ended one of the most interesting sessions in the history of the Lake Erie Association. The attendance was not only large—some thirty members and visitors being present—but the meetings were full of profit for all concerned. The next—the quarter-centennial—meeting, will be held in this city, four days, commencing the first Tuesday in May, 1888. Every effort will be put forth to make it the most important in the history of the association, and one which will fittingly commemorate its quarter-centennial anniversary.

DENTAL SUGGESTIONS.

BY JOHN D. WINGATE, D. D. S.

The difference in the effect of hand-pressure, as compared with malleting, is easily shown on a heavy piece of lead. The mallet-stroke will sink the plugger-point much deeper into the lead than will hand-pressure. From this standpoint the value of mallet instruments may be estimated.

At the eighteenth annual meeting of the First District Dental Society of New York, there was a fine display of instruments, among which were some mallet-pluggers. The writer disgusted the exhibitor of a mechanical mallet not a little by trying his noisy instrument with pressure, when it stopped hammering. In the estimation of the writer, such an instrument is worthless. It will give only surface condensation unless the blow is made unpleasantly heavy for the patient, who may be deemed to be entitled to some consideration.

The amount of greasy matter which is absorbed by porcelain teeth when worn for a time, is surprising. Even a gold plate, after a few years' wear, becomes so impregnated that a piece half an inch square will give off an unbearable odor when heated. The ground surfaces at the joints between gum-sections are soon covered with this greasy deposit. When the plate is worn, and when repair is necessary, the vulcanizing process seems to char it: making dark, disgusting looking joints. If the blocks are removed from the plate and boiled for

an hour in a solution of bicarbonate of soda, they will be thoroughly cleansed from grease. The blocks may be removed from the plate by heating it. A plaster model should first be run on its palatal side, to prevent warping. After the blocks are removed, the edges of the fracture—if the plate is broken—are easily cut away, to secure fresh surfaces for the new rubber to adhere to, and if sufficient of the old rubber is removed to allow the new material to reach the pins in the blocks next the fracture, a very strong joint will be made.

In mixing plaster-of-Paris, if as much sugar as will lay on a silver five-cent piece is added to the water used, the cast will be found to be surprisingly hard, even if the plaster should be poor. For quick setting, both sugar and salt may be added. The addition of alum or cream of tartar will retard its setting.

If a coil of sheet zinc is put into the water in a vulcanizer, it will prevent the formation of much of the black oxide which is found on iron flasks and clamps. After the zinc has been used three or four times, the flasks will soil the fingers but very little when handled.

Partial impressions should be well flooded with water just before the plaster is poured. The plaster should be mixed considerably thicker than usual, as the water left in the impression will mix with it and render it thinner. After the impressions of the teeth are filled, pieces of wire may be dropped into them to strengthen them. A cast from a well-drenched impression will show but few, if any, air bubbles, as the water leads the plaster over the surfaces and into the depressions.

BLEACHING TEETH.

There are many methods of performing this every-day operation; some are good and others very bad. Teeth may be bleached with hot air, by electricity, with peroxide of hydrogen, but no single method can be used satisfactorily for all cases. A correspondent desires some information on this subject, and we present the following as one method :

After the root has been filled, and the tooth is free from tenderness, apply the dam, dry the cavity, and remove all discolored decay. Wash the cavity several times with fresh peroxide of hydrogen, and place a few crystals of chloride of alumina in the cavity (this may be procured of E. H. Sargent & Co., Chicago), moisten them with peroxide, and wait from three to five minutes, wash the cavity thoroughly with distilled water, then apply a solution of thirty grains of borax to the ounce of water, until the acid is entirely neutralized.

Dry the cavity with hot air, and paint the interior with copal ether varnish. When it is dry, mix oxychloride of zinc of the desired color, and fill the cavity full; allow it to harden, then prepare the cavity for the gold filling, and fill it at once. It will be noted that the whole operation is to be made at one sitting, and that oxyphosphate of zinc is not recommended as a lining for the cavity, or base for the gold filling. In the central and lateral incisor teeth we have glued white unruled note-paper to the labial walls with varnish, then covered it with oxychloride, and afterwards filled with gold, and had a good result as regards color. A cause of failure is the performance of the operation on different days, thereby allowing moisture from without to gain entrance to the cavity, and contaminate the oxychloride. Never use a steel instrument when mixing it, and always allow the water of crystallization to be seen on the surface before cutting into it. Follow these procedures, and you will be surprised at the results.—*Editorial in Dental Review.*

DON'T READ THIS.

Messrs. JOHNSON & LUND:—

Gentlemen:— * * * * * I must confess my regrets that I did not know the true inwardness of your "EXTRA TOUGH" Dental Rubber ere this time, and am really sorry I did not take your advice long since, as with the extra tough rubber, treated according to directions, I can make plates almost as thin as gold plate, and much stronger than with any other rubber I have used of three times the thickness, and find that it takes kindly to the mouth and causes no irritation. You are at liberty to use this if you wish. Hastily, &c.,

E. D. WILLIAMS, D. D.,

Wilkesbarre, Penna.

MY METHOD OF BRIDGE-WORK.

BY H. W. RUNYAN, D. D. S., EATON, OHIO.

There is no doubt that bridge-work is very valuable in many instances, for partial dentures. But the great cost of the gold process places it within reach of comparatively few, while there are fewer practitioners of dentistry that thoroughly understand the swaging and soldering of gold that is necessary in the construction of the gold bridge-work. The method here described will place it within the reach of all who can afford a plate of any kind, and it can be con-

structed by any one capable of making a vulcanite plate, and I think it will last as long as any bridge-work, or as long as the roots, to which it is attached, will last.

PROCESS OF CONSTRUCTION, for a case where the four incisors are missing and the cuspid roots remain :

After cutting the cuspids down to, or a little above, the margin of the gum, prepare by drilling out the canal with an inverted cone-bur, and then a pointed fissure-bur. By so doing a perfect funnel-shaped canal is formed, which gives strength to the work, and facilitates access to the end of the root. Take a platinum bar long enough to reach from one root to the other, and bend at right angles to form the pins. Now set the bridge support in place, after bending to conform with the gums ; and take the impression and articulation. Make the model, place on the articulator, and wax on vulcanite teeth. Remove from the articulator, flask and vulcanize, after covering all the rubber with vulcanizable gold.

Gum teeth can be used for the bridge between the roots, if the alveolar process has been absorbed very much.

After vulcanizing, clean up and fasten in by placing a little cement on the pin that extends into the cavity formed by the fissure-drill. The rubber will fill that part formed by the inverted cone.

Use the best rubber, run the vulcanizer slowly up to 300° Fah. and vulcanize for one hour and fifteen minutes. You will have "a thing of beauty, and a joy" to your patient and yourself.—*Ohio Journal of Dental Science.*

PENNSYLVANIA STATE BOARD.

The State Board of Dental Examiners will meet, with the State Dental Society, at Glen Summit, Luzerne County, Tuesday, July 26th, 1887.

Candidates for Examination should be prompt in attendance, and call upon the Secretary, Dr. J. C. Green.

N. E. MAGILL,
President.

AMERICAN DENTAL ASSOCIATION.

CHANGE OF PLACE OF MEETING.

The Twenty-Seventh Annual Meeting of the American Dental Association will be held at Niagara Falls, commencing Tuesday, August 2d, 1887.

GEO. H. CUSHING,
Recording Secretary.

HIGHLY IMPROVED MODELLING COMPOSITION

—FOR—

Taking Impression of the Mouth or any other purpose where
a Perfect Impression is required.



DIRECTIONS.—Soften the Composition in hot water, and when soft enough work into the desired shape with the fingers; place it in the cup, and then soften the surface with dry heat. This makes the surface softer than the main body, it takes a better impression, and hardens quicker. Should dry heat be used exclusively, wet the fingers occasionally, to prevent the Composition from sticking. It is not necessary to oil the impression before pouring the plaster cast, as the Composition can be easily removed by immersing for a few minutes in hot water.

No. 0.—EXTRA SOFT.—This grade is for restoring any of the other grades which have become hard by frequent use; they may be mixed in hot water.

No. 1.—SOFT.—This grade is for use in cold water and in tender mouths, and softens at a low heat; hardens in two minutes.

No. 2.—MEDIUM.—This grade is mostly used and requires a higher heat to soften than No. 1, and sets quicker.

No. 3.—For use in hot weather, and requires a higher heat to soften than No. 2, and hardens quicker.

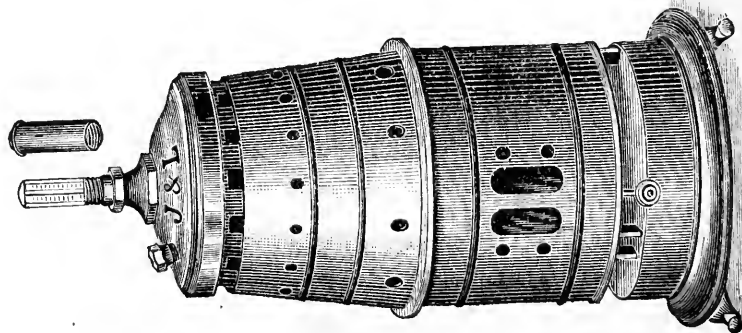
☒ **No. 2** will always be sent unless other numbers are specified.

Price per pound . . \$1.25. per half-pound box . . \$0.63

" five pounds purchased at one time . . . 5 63

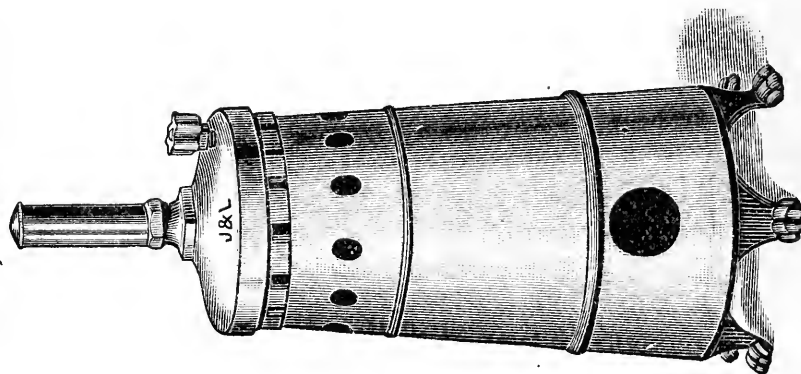
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IMPROVED VULCANIZERS, MERCURY BATH, BRASS FLASKS, ETC.



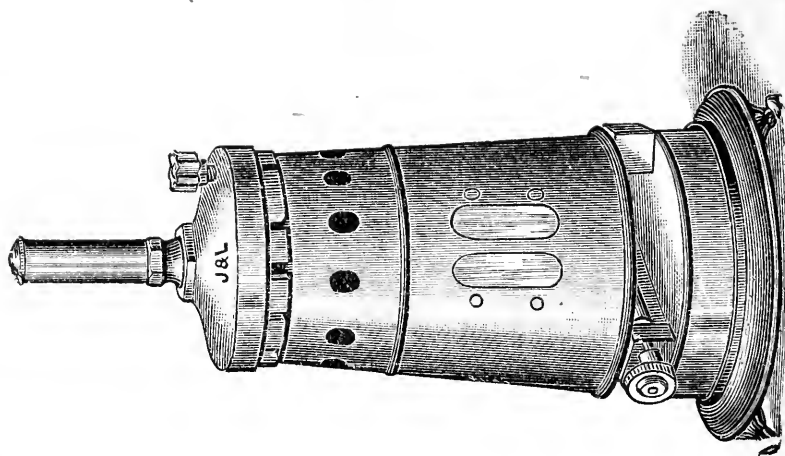
OUTFIT A.

Rigged for kerosene with Union stove.
One-case complete with Anchor Flasks, etc., \$14.00
Two-case ditto 15.00
Three-case ditto 16.00



OUTFIT B.

Rigged for kerosene with new attachment.
One-case complete with Anchor Flasks, etc., \$13.00
Two-case ditto 14.00
Three-case ditto 15.00



OUTFIT C.

Rigged for gas or alcohol
One-case complete with Anchor Flasks, etc., \$13.00
Two-case ditto 14.00
Three-case ditto 15.00

Improved Vulcanizers, Mercury Bath, Brass Flasks, Etc.

These vulcanizers are made in the general style of the "Whitney." The boilers are of extra thick copper, and made much wider than those in ordinary use. The inside diameter of the Jounson & Lund Vulcanizer measures fully $4\frac{1}{4}$ inches, while the "Whitney" and "Hays" measure but 4 inches. The great advantage of this increased diameter will be appreciated at a glance, as it enables the dentist to use the largest size of flasks when necessity demands it. That the profession may be thoroughly satisfied of the ample strength of these vulcanizers, we assure them that each boiler has been tested by and sustained a hydrostatic pressure of 500 lbs. to the square inch; and as the elastic force per lb. to the square inch at 320° Fahrenheit (the degree at which dental plates are generally vulcanized), is but 88 lbs., our Vulcanizers are capable of resisting more than three times the force required. But this liberality of resisting power is no excuse for carelessness on the part of the operator.

Johnson & Lund's Improved Vulcanizers are furnished with thermometer, mercury bath, one packing in place and an extra piece, extra disks for the safety-valve, requisite number of wrenches, malleable iron or brass flasks at option of purchaser. When no flasks are mentioned the brass ones will always be sent with the apparatus. We especially call attention to the flasks furnished with these Vulcanizers. They are of the pattern known as the **ANCHOR FLASKS**. Owing to their peculiar formation, an extra amount of room is afforded for the case to be vulcanized, and the bolts can be detached and replaced with great facility, without removing the screw from the nut.

REPORTS.

Donham's Spring Pressure fitted to a Vulcanizer, adds \$1.25 to the Price.

One-case Vulcanizer, copper boiler, furnished with thermometer, packing jacket, lamp, disks for safety-valve, two flasks (either malleable iron or brass, at the option of the purchaser), and wrenches—complete for alcohol
Ditto—complete for gas
Ditto—complete for kerosene
Two-Case complete for gas
“ complete for alcohol
“ complete for kerosene
Three-Case Vulcanizer—complete for gas
“ —complete for alcohol
“ complete for kerosene

If the stove part is furnished with the kerosene burner, when sold in connection with the Vulcanizer there will be an extra charge of

Two-Case Boiler, cover, thermometer, wrenches .	\$10 50	Round Wrench for Boiler .
Three-Case " "	11 50	Straight " "
Two-Case Boiler, without cover and thermometer	6 00	Flask Wrench
Three-Case " "	7 00	Raised Bed-Plate
Thermometer-Case and Tube, complete	2 00	Bed-Plate and Wrench
Outside Thermometer-Case	50	Wrench, double end
Inside "	50	Felt Wicks for Union Keros
Cover, with Thermometer-Case and Thermometer	7 00	" " " "
" " " "	5 00	Canvas Wicks for Union Keros
New Ring to Boiler	2 00	" " " "
" Bottom to Boiler	2 00	Felt Wicks for Union Keros

NOTE.—The kerosene burner we are now furnishing with our Vulcanizer has but one burner; but that burner is four inches wide, instead of only two inches wide, which is the size of the burner belonging to the No. 1 Union Stove. This increased size makes the new burner equal to the two-burner stove, and at no increased expense.

No. 1 Union Kerosene Stove, with one burner two inches wide	\$2 00
" " " " " four inches wide	2 25
No. 2 " " " two burners each two inches wide	3 00
Vulcan Gas Stove	1 50

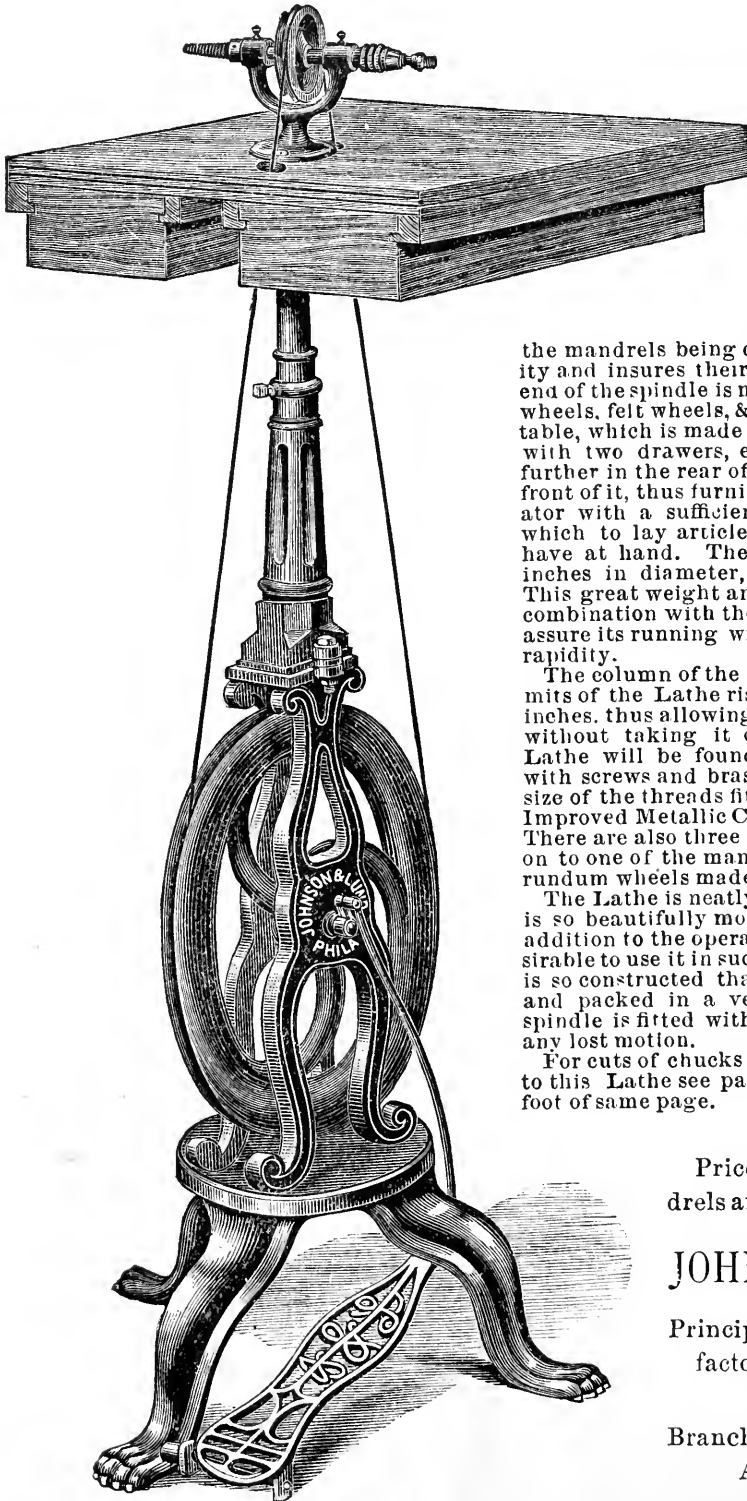
NOTE.—We make no allowance where Vulcanizers with malleable iron flasks are

NOTE—We make no allowance where Vulcanizers with malleable iron flasks are ordered instead of brass ones.

25	Felt Wicks for Union Kerosene Stove, 4 in. per doz.	\$1 00
25	Endless Packing, for J & L's Vulcanizer, each	05
10	" " " " " "	60
1 00	Ordinary " " Whitney " each	05
50	" " " " " "	60
25	" " " " Hayes " each	10
25	Alcohol Lamp, for Vulcanizer	60
05	Jackets " " " " " "	35
10	Thermometers, each	75
05	Base, for either alcohol or gas	25
60	Gas Burner for Vulcanizer	60

ADVANCE IN PRICE.

Owing to the increased cost of labor and raw material, we have been obliged to advance the cost on No. 1 Improved Dental Lathe to \$19.



JOHNSON & LUND'S

IMPROVED

DENTAL LATHE, No. 1

In the construction of this Lathe we have introduced several novelties which only need to be seen to be appreciated. In the first place, one end of the spindle is made with a split-chuck and collar, which admits of

the mandrels being changed with great facility and insures their running true; the other end of the spindle is made taper, to carry brush wheels, felt wheels, &c. In the next place, the table, which is made of solid walnut and fitted with two drawers, extends about 1½ inches further in the rear of the head than it does in front of it, thus furnishing the dentist or operator with a sufficiency of table room upon which to lay articles that it is desirable to have at hand. The driving-wheel is fifteen inches in diameter, and weighs 24 pounds. This great weight and enlarged diameter, in combination with the small size of the pulley, assure its running with great ease, power and rapidity.

The column of the Lathe, being hollow, permits of the Lathe rising and falling over six inches, thus allowing the cord to be tightened without taking it off. Accompanying the Lathe will be found three mandrels, fitted with screws and brass shoulders, one for each size of the threads fitted in Johnson & Lund's Improved Metallic Centre Corundum Wheels. There are also three brass chucks which screw on to one of the mandrels, for using with corundum wheels made without metal centres.

The Lathe is neatly painted and gilded, and is so beautifully modeled that it is quite an addition to the operating room, when it is desirable to use it in such a position. The Lathe is so constructed that it can be taken apart and packed in a very small compass. The spindle is fitted with an appliance to take up any lost motion.

For cuts of chucks and mandrels belonging to this Lathe see page 9 of adv. and note at foot of same page.

Price complete, with Mandrels and Chucks, boxed, \$19.

JOHNSON & LUND,

Principal Depot and Manufactory, 620 Race Street, Philadelphia.

Branch Depot, 514 Wabash Avenue, Chicago.

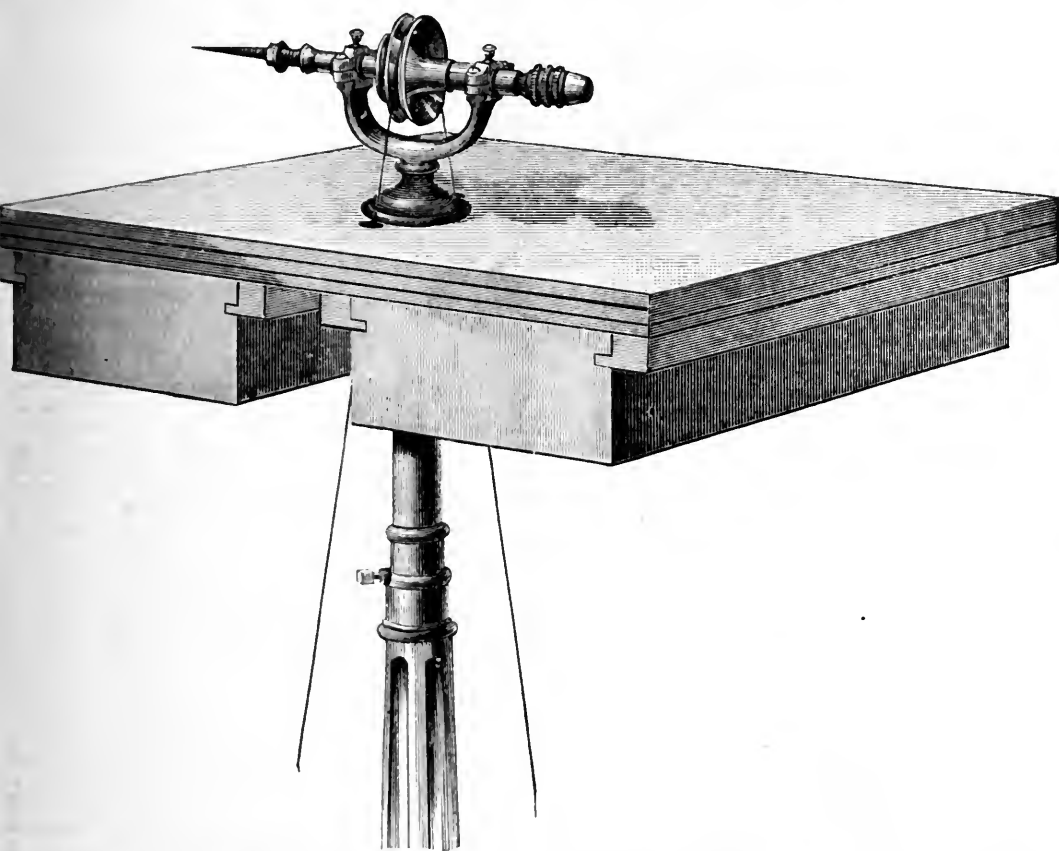
ADVANCE IN PRICE.

Owing to the increased cost of labor and Raw Material, we have been obliged to advance the cost on No. 2 Improved Lathe to \$24.00.

JOHNSON & LUND'S

IMPROVED

DENTAL LATHE NO. 2.



The stand and table of this Lathe are precisely the same as the stand and table of J. & L. Improved Lathe. (See opposite page.) The Lathe Head is an exceedingly fine article; the workmanship and materials being of the very best quality. The bearings are accurately fitted and so arranged that any lost motion which may occur by wear can be taken up with rapidity and accuracy. It is furnished with a crone-screw on one end and a split-chuck upon the other. The chuck is made with a cross-pin at the rear end, which is grasped by the split ends of the Mandrels, thus giving them very long bearings. The oil holes are covered with handsome metal screw caps. The spindle and pulley wheels are highly finished and the frame work is Japanned. The Lathe is so constructed that it can be packed in a very small compass.

PRICE.

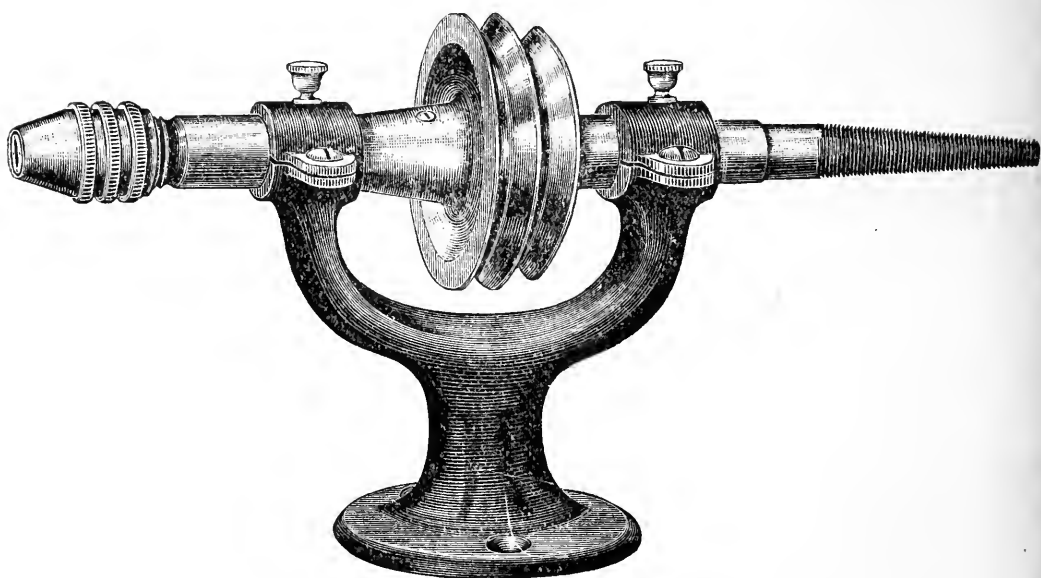
Lathe Complete, with ten Chucks,	-	-	\$24.00
" Without Chucks,	-	-	21.00

For cuts of the ten Chucks and Mandrels, see page 9 of adv.

JOHNSON & LUND,

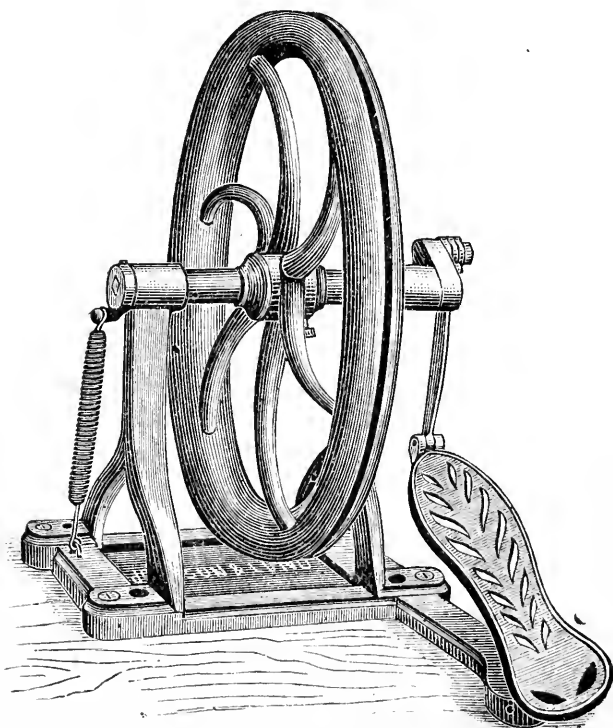
Principal Depot and Manufactory, 620 Race Street, Phila. Branch Depot, 514 Wabash Avenue, Chicago.

LATHE HEAD, NO. 1.



This Lathe Head is furnished with a split-chuck and collar, which allow the mandrels to be changed with great facility, and insures their moving true; the other end of the spindle is made taper to carry brush wheels, felt wheels, &c. Accompanying the Head will be found three mandrels, fitted with screws and brass shoulders, one for each size of the threads, fitted in Johnson & Lund's Improved Metallic Centre Corundum wheels. There are also three brass chucks, which screw on to one of the mandrels, for using corundum wheels made without metal centre. For the cuts of the mandrels and chucks belonging to this Lathe Head see page 9 of adv. and note at bottom of same page. PRICE COMPLETE, WITH MANDRELS AND CHUCKS, \$6.00.

The Lawrence Driving-Wheel.



This is by far the most serviceable foot-power ever offered for general use to the profession. The Wheel measures $18\frac{1}{2}$ inches in diameter, and weighs 45 pounds. The entire apparatus is handsomely painted, and each wheel is furnished with a spring, for the purpose of keeping the wheel, when at rest, off the centre and ready for action.

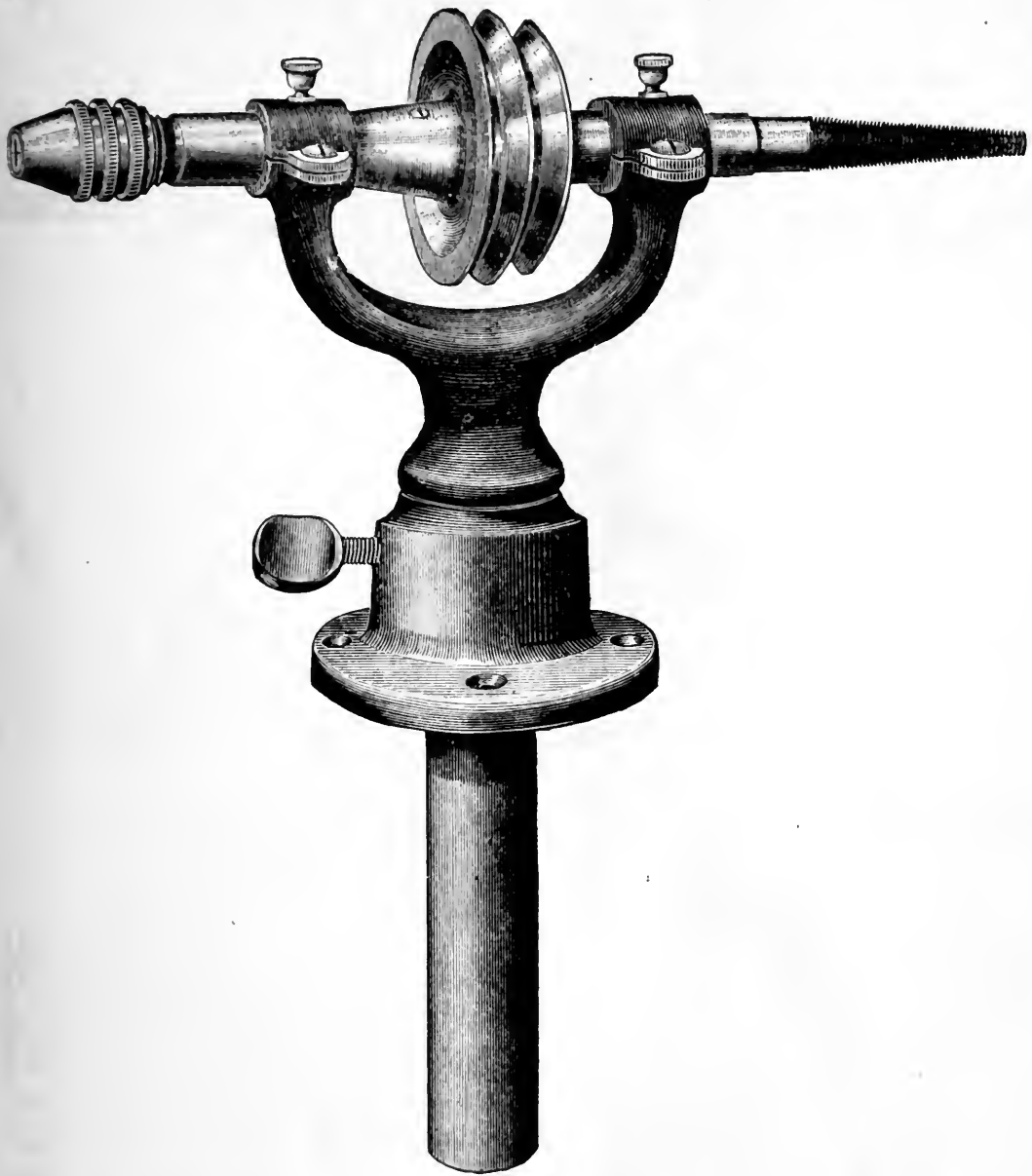
The cut is a faithful representation of the article itself.

—o—

Driving-Wheel \$11.00

Cord and Couplings50

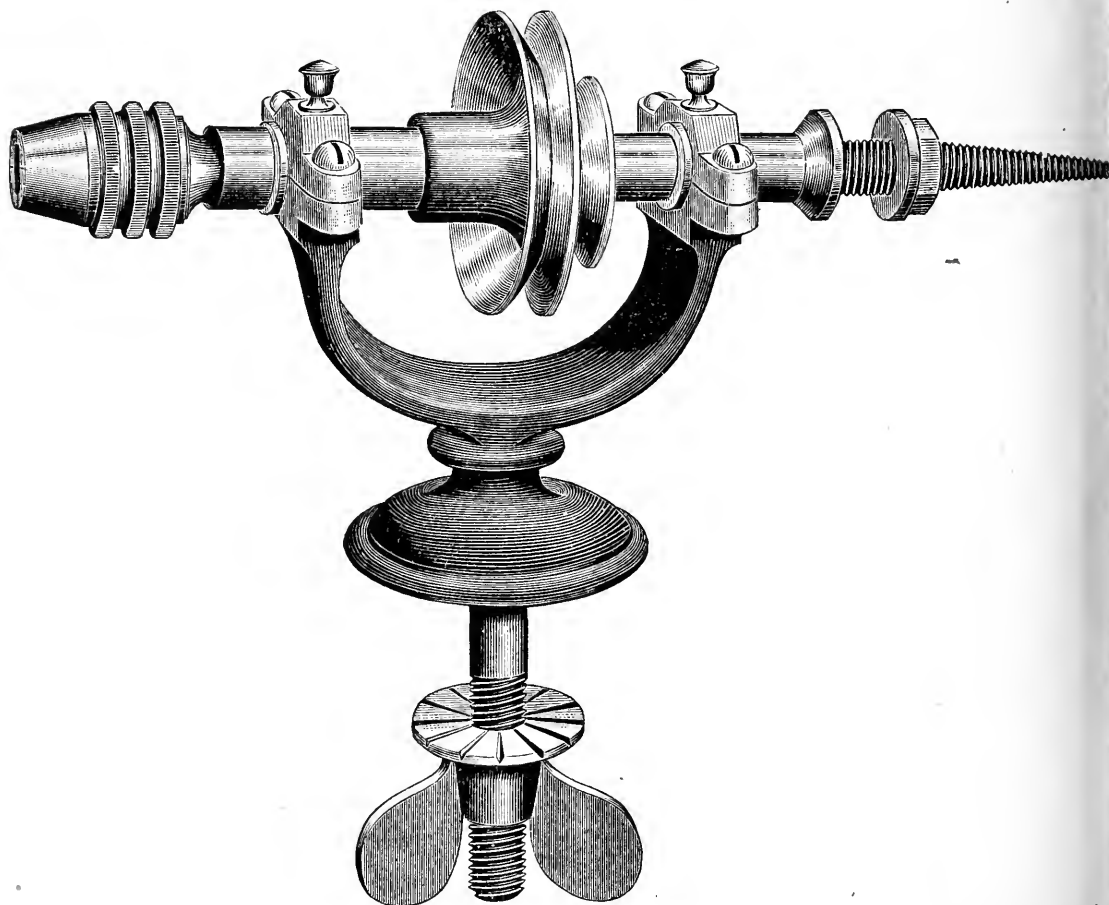
SOCKET LATHE HEAD.



This Lathe Head is so constructed that it can be raised or lowered $4\frac{1}{2}$ inches. This admits of its being made to suit the height of the operator, and also to tighten the cord, without removing it from the Lathe. This Lathe Head is furnished with a split-chuck and collar, which admit of the mandrels being changed with great facility, and insuring their running true. The other end of the spindle is made taper, to carry brush wheels, felt wheels, &c. Accompanying the Lathe will be found three mandrels, fitted with screws and brass shoulders, one for each size of the threads fitted to Johnson & Lund's corundum wheels. There are also three brass chucks which screw on one of the mandrels, for using corundum wheels made without metal centres. For cuts of the mandrels and chucks which accompany this Lathe Head see page 9 of adv. and note at bottom of same page.

Price complete, with Mandrels and Chucks,.....\$7.00.

LATHE HEAD No. 4.

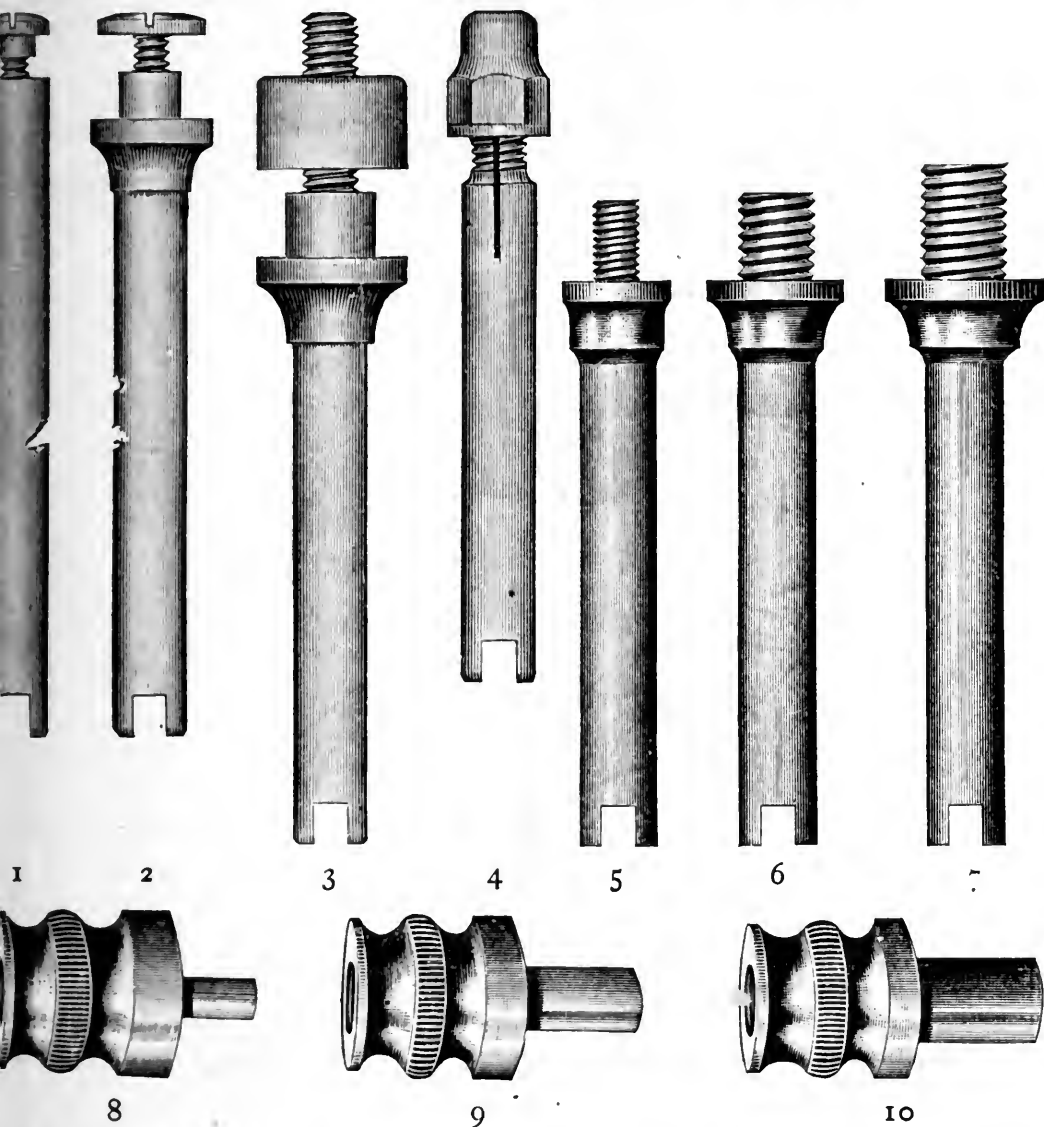


This Lathe Head in connection with the Lawrence Driving-Wheel, makes the most complete and satisfactory Dentist's Lathe in the market. It is the best article of the kind ever offered. The workmanship and materials used are of the very best quality. The bearings are accurately fitted and so arranged that any lost motion which may occur by wear can be taken up with rapidity and accuracy. It is finished with a cone-screw on one end and a split-chuck upon the other. The chuck is made with a cross-pin at the rear end, which is grasped by the split ends of the mandrels, thus giving them very long bearings. The oil-holes are covered with handsome metal screw caps. The spindle and pulley-wheel are highly finished and the frame work Japanned. Ten chucks and mandrels are supplied with the lathe, if desired. For cuts of chucks and mandrels see opposite page.

PRICE.

Head complete, with ten chucks,	-	-	-	\$11 00
Head, without chucks.	-	-	-	8 00

CHUCKS AND MANDRELS FOR LATHE-HEAD NO. 4, AND JOHNSON AND LUND'S IMPROVED LATHE NO. 2.



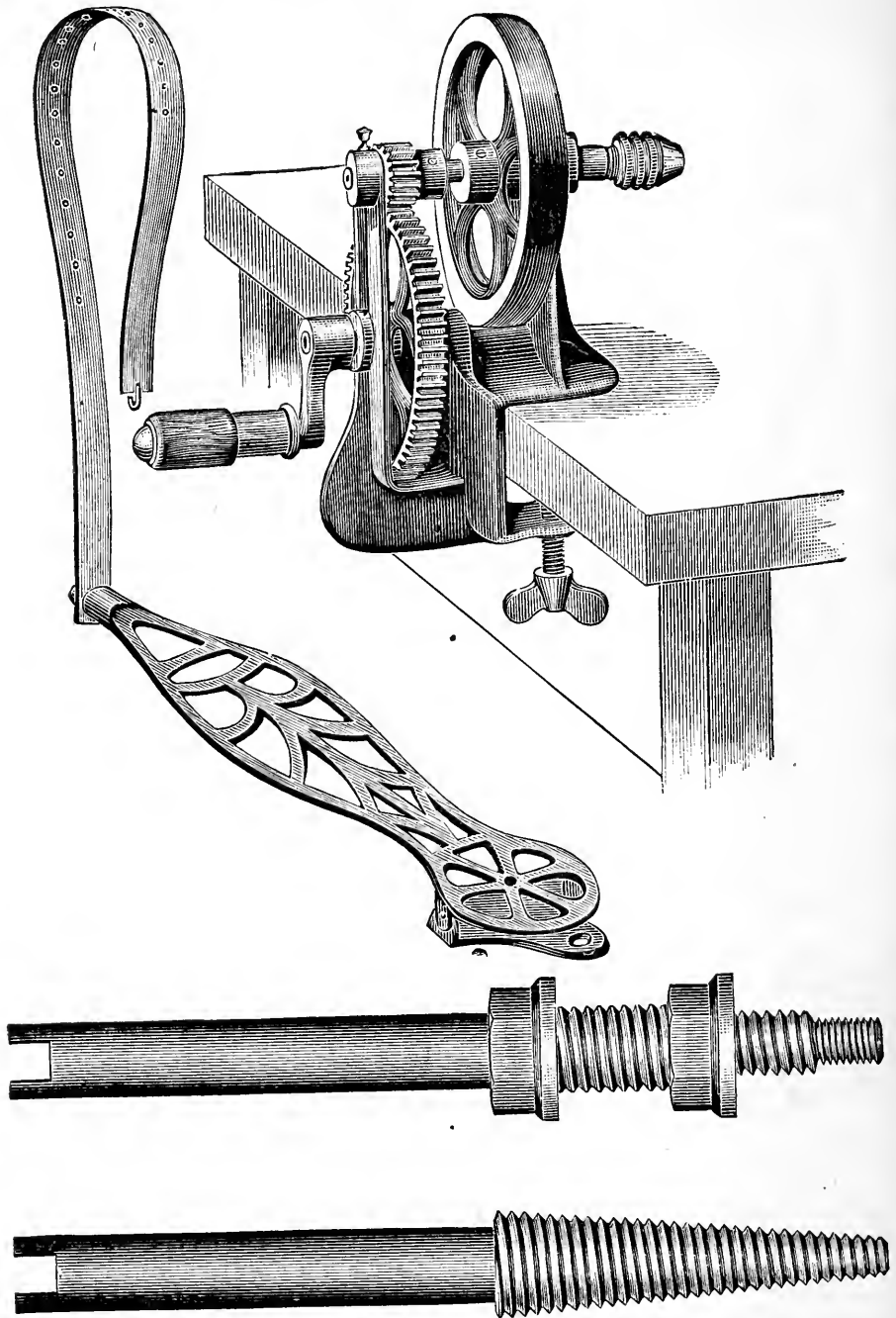
Nos. 1, 2 and 3 are screw chucks for corundum wheels, &c. No. 4 will carry engine burs, drills and tools. Nos. 5, 6 and 7 are screw mandrels for the improved metal-centre corundum wheels. Nos. 8, 9 and 10 are brass chucks fitting upon No. 7, and are intended for shellacing corundum wheels on.

PRICE.

Set of ten Chucks,	-	-	-	-	\$3 50
No. 1,	-	\$ 30	No. 5,	-	35
No. 2,	-	45	No. 6,	-	40
No. 3,	-	60	No. 7,	-	45
No. 4,	-	1 00	No. 8, 9, 10, each,	-	25

NOTE.—A set of Chucks to accompany Improved Lathe No. 1. Lathe Head No. 1 and Socket Lathe Head, consists of Nos. 5, 6, 7, 8, 9, 10. Illustrated above.

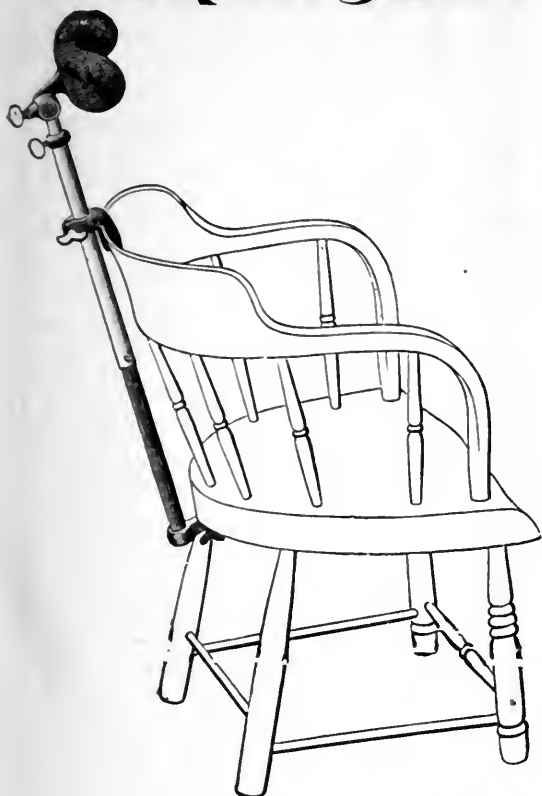
Hand and Foot Lathe.



The above cut illustrates our HAND AND FOOT LATHE. It is made with a Split-Chuck similar to the one fitted to our Improved Dental Lathe and various Lathe Heads. It is furnished with a taper Mandrel for the accommodation of Brush Wheels, Felt Wheels, Cones, etc., and with a Universal Mandrel which will fit any size of Corundum Wheel, Cone or Cup, made with the Improved Brass Centre, from the very smallest to the largest and thickest sizes. We also send with the Lathe three brass Chucks (illustrated on page 9 of adv.), which screw upon the Universal Mandrel for the convenience of those preferring to use Corundum Wheels without the metallic centre. The Lathe weighs, with two Mandrels and three brass Chucks, complete, seven pounds and twelve ounces. The geared wheels are machine-cut, and the workmanship throughout is of the best description.

PRICE, COMPLETE.....\$6.50.

PORTABLE HEAD-REST.



This Head-Rest can be attached to any chair; is very firm and can be raised, lowered or moved backward or forward without interfering with the attachment to the chair. It occupies a space only 13 by 4 inches, and weighs less than four pounds.

Price, \$5.00.

JOHNSON & LUND,

PRINCIPAL DEPOT:

620 Race St., Philadelphia.

BRANCH DEPOT:

514 Wabash Ave., Chicago.

DALY'S CHEMICALLY PURE GOLD LINING.

RUBBER SORE MOUTH CURED AND PREVENTED.

EACH BOOK CONTAINS 8 SQUARE INCHES OF GOLD LINING

OLD RUBBER PLATES LINED.

Every Part of New or Old Plates can be Lined with It.

This lining presents advantages that no other can. It is formed entirely of chemically pure gold. It is united mechanically with the rubber of the plate without the intervention of any other metal or of rubber or any other cement between it and the plate.

Being so formed and so united there can be no tarnish or chemical change of state from the action of the secretion of the mouth, or from the effects of galvanic action between different metals in contact. Its union with the rubber is so perfect that it cannot be separated from it, and its removal involves the destruction both of the lining and the portion of rubber with which it is in contact.

Every surface of the plate can be lined with it if so desired. Old plates, no matter how long worn, can be lined with it, preserving perfectly the fit and articulation. Being formed entirely of pure gold, it will not only prevent rubber sore mouth, but will cure that disease where applied to rubber plates that have produced it.

The cost of lining plates with it will be seen to be small by taking the price of a book of it and counting how many plates of different sizes can be covered by eight square inches of lining, the amount contained in each book.

Full Instructions with Each Book.

PRICE PER BOOK.....\$3 50.

The following named dentists in Baltimore and Washington made arrangements as published in the Baltimore Sun of January 5th, 1886, to use this lining.

BALTIMORE.—Doctors T. S. Waters, W. H. Hoopes, W. B. Finney, C. E. Duck, T. H. Davy, S. O. Pennington, J. C. Uhler, O. F. McDonald, B. M. Wilkerson, J. B. McPherson, B. Holly Smith, C. E. Blerbower, W. S. Norris, A. P. Krouse, J. A. Webb, A. G. Flaney, E. P. Keech, M. W. Foster, A. P. Gore, T. W. Coyle, T. F. Cherry, W. P. Welsh, H. G. Ulrich, Bernhard Myer, T. F. Lang, A. J. Brown, A. J. Volek, H. E. Hardey, C. S. Grindall, W. A. Mills, J. H. Parker, L. J. Pearce, J. E. Orrison.

WASHINGTON.—Doctors James B. Hodgkin, L. C. F. Hugo, H. M. Schooley, Wm. Merrill, D. O. Knight, Thos. O. Hills, M. F. Finley, R. N. Gunnell, S. B. Muncaster, J. B. Ten Eyck, S. F. Newton, Geo. B. Welch, John L. Wolf, E. R. Rust, R. Finley Hunt, W. Donnally, H. B. Noble, E. B. Bliss.

Steurer's Plastic Gold.

We respectfully call attention to a new form of **Dental Gold**, that we have introduced to the profession under the name of "**STEURER'S PLASTIC GOLD.**"

It is a chemically pure Gold in a plastic state, without admixture of any foreign substance, of a brown color and homogeneous appearance.

We claim the following advantages over all other forms of Gold heretofore used:—

1st. It is more cohesive.

2nd. It has a spreading quality before it is completely condensed, so that it can be moulded into any cavity.

3rd. A tooth can be filled in one-third of the time it takes with any other Gold, simple hand pressure being sufficient to make a solid filling, the mallet (which is so disagreeable to most patients) can be dispensed with, and so sensitive teeth, or those whose walls are frail, can be easily filled.

DIRECTIONS FOR USE.

Take a piece of gold about the width of the cavity and gently knead it in with a large instrument (as if it were putty) by pressing it from the centre well up against the walls of the cavity. When somewhat compact, work it over with a smaller instrument until all the brown particles disappear and it has a bright frosted surface.

Add another piece by first making firm pressure with the instrument so as to make it adhere to the condensed piece at one point, and then gently knead the rest into the cavity, and then as before press it until it becomes frosted.

Use large broad points with slight serrations. Amalgam carriers and files make good instruments to knead it into a cavity. When the cavity is slightly overfilled, then burnish down, being careful to overlap the edges. Finish with file, etc., as usual.

Being chemically pure Gold, without admixture of any foreign substances, it will hold its color. If by the lapse of time it should lose any of its cohesiveness, you simply heat it upon a thin sheet of mica over an alcohol lamp. Do not use too large pieces, and pick them up from a hard surface, such as a piece of stiff paper. By keeping it in the bottle it can be kept for a long time without annealing.

Beware of worthless imitations. Be careful to see that it is in the shape of small square pieces, packed in bottles, and labeled *Steurer's Plastic Gold*, because the imitations, although they may apparently work tolerably in the commencement, do not make a solid filling, but gradually crumble away.

AS WE HAVE TO PAY CASH FOR THE GOLD AND THE MARGIN
IS SO SMALL, WE MUST SELL FOR CASH ONLY.
PLEASE SEND CASH WITH ORDER.

Price Per Bottle, 1-16 oz., \$2.50. Sent postage free on receipt of price.

JOHNSON & LUND,

DENTAL DEPOTS,

620 Race Street, Philadelphia.

514 Wabash Avenue, Chicago.



**1000
FINE**

JOHNSON & LUND'S
DOUBLY REFINED

**EXTRA TOUGH
GOLD FOIL.**

PHILADELPHIA
620 RACE ST.



CHICAGO
514 WABASH AVE

COHESIVE. EXTRA COHESIVE.
SOFT OR SEMI-COHESIVE.

Each Grade Uniform in Quality. Does not Ball up under the plugger. Its absolute purity is unquestioned.

Nos. 3 to 240.

Works with the utmost smoothness. Exhibits great softness under the burnisher. Possesses a wonderful amount of durability and toughness.

PRICE.

Per $\frac{1}{8}$ ounce.	-	-	\$4.00	Per 1 ounce,	-	-	\$29.00
" $\frac{1}{4}$ "	-	-	7.75	" 2 "	-	-	57.00
" $\frac{1}{2}$ "	-	-	15.00				

RUBBER DAM IN TINS.

1-2 POUND, \$1.50.

Extra Tough Coffer-Dam Rubber.

Packed in

TIN CANS.



Manufactured Expressly for

JOHNSON & LUND,

620 RACE STREET, Phila.

514 WABASH AVENUE, Chicago, Ills.

We take pleasure in calling the attention of the profession to a new article of Rubber Dam, made in the most careful manner of the best Para Rubber, no adulterations being used in the manufacture, the Dam consisting entirely of Rubber, sufficient of sulphur only being used to properly vulcanize it. It is cut in strips $8\frac{1}{2}$ inches wide and from $3\frac{1}{2}$ to 4 yards long, being a very handy size for general use. It is packed in METAL TUBES with a MOVABLE LID made as nearly AIR TIGHT as possible, in which the Dam can be kept, thus assisting very materially in preserving the strength of the material.

PRICE

Per can containing $\frac{1}{2}$ lb. Thin,	-	-	-	\$1 00
" " " $\frac{1}{2}$ " Medium,	-	-	-	1 50
" " " $\frac{1}{2}$ " Thick,	-	-	-	2 00

Sent Postage Free on receipt of price.

Rubber Dam by the Yard.

35 Inches Wide. There is none made wider.

The Best Coffer-Dam Rubber,

Impossible to make any better—35 inches wide.

The above Rubber-Dam is made especially for us and to our own particular order, so that we know just what we offer to the profession and what we know is, that it is impossible to make any better. Some time since we were obliged to buy some Coffer-Dam Rubber, which was advertised as a *very superior article*, to supply a customer who was impressed with the advertisement of the same, the result was, that he found it tender and returned it to us unfit to be used, we replaced it with our own; with which he was very well satisfied.

Thin,	-	-	-	-	per yard, \$1 00
Medium,	-	-	-	-	" " 1 50
Thick,	-	-	-	-	" " 2 00

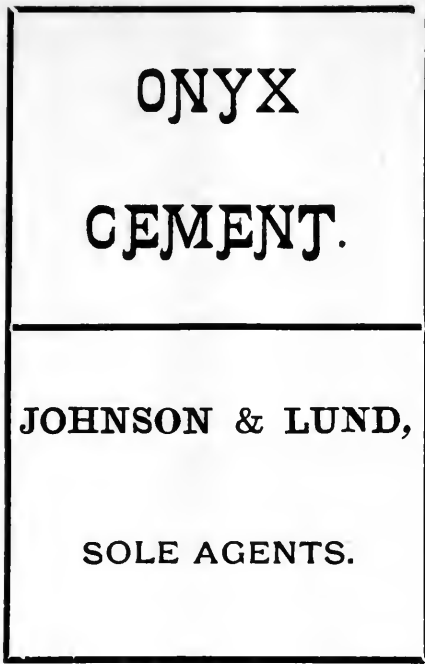
CAUTION.

Much of the Coffer-Dam Rubber advertised by other depots, and offered by their travelers is but $26\frac{1}{4}$ inches wide, is 20 per cent. less material to the yard than ours. For instance, our Medium 35 inch wide at \$1.50 per yard is as cheap as $26\frac{1}{4}$ inch of equal quality would be at \$1.12 $\frac{1}{2}$ per yard.

JOHNSON & LUND,

620 Race St., Philadelphia.

514 Wabash Ave., Chicago.



ONYX CEMENT.
A PHOSPHATE OF ZINC.

It is the strongest, most dense, and in all respects possesses greater uniformity in all the essentials of a First-Class Filling than any other offered to the profession.

PUT UP IN PACKAGES CONTAINING HALF OUNCE.

Price, per Package, - - - - \$1.00.

Each package of the "Onyx" Cement will contain a small piece of the "Asbestos Felt," so that the operator may have an opportunity of testing its value.

PHOSPHATE OF ZINC.
PREPARED BY DR. C. N. PEIRCE.

The packages for the next four months will contain a small piece of ASBESTOS FELT, so that those desiring may have the opportunity of testing its value as a lining for cavities, and as a nerve cap.

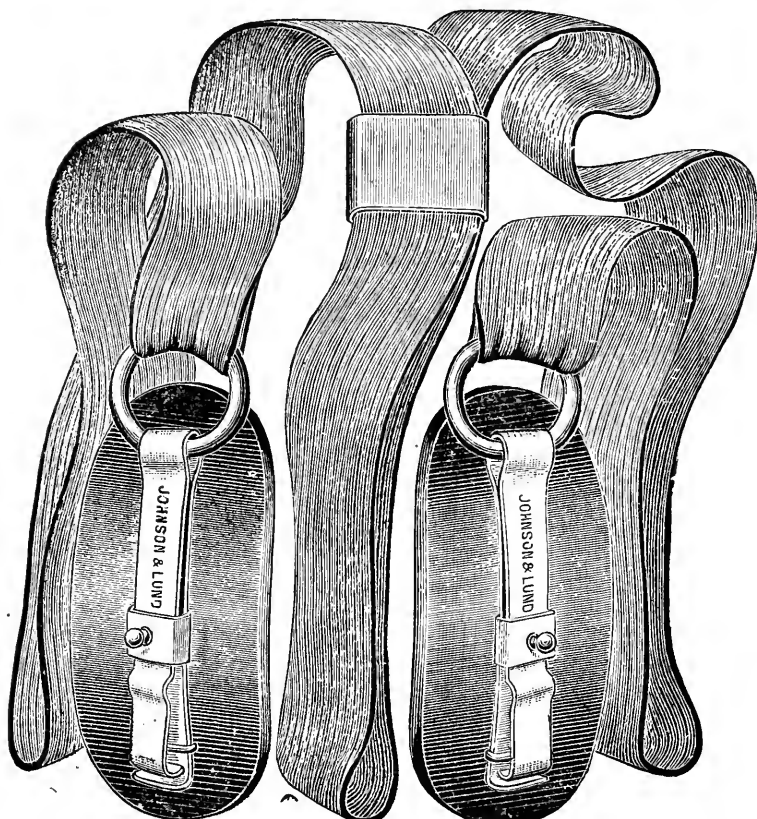
Price, per Package, - - - - \$2.00.

JAPANESE BIBULOUS PAPER.
REDUCTION IN PRICE.
OUR OWN IMPORTATION.

We are just in receipt of a large invoice of Japanese Bibulous paper direct from Yokohama. By importing this absorbent directly from Japan, we save the profits which we have heretofore been obliged to pay to the importers, which enables us to have the pleasure of announcing to the profession a further reduction in price.

Price, per 100 Sheets, - - - - \$.40
 " 500 " - - - - 1.75

RUBBER DAM AND NAPKIN HOLDER DR. COGSWELL'S.



A very convenient and effective arrangement for holding the ends of the rubber back and up while operating. It consists of an elastic ribbon attached to two oval buffalo-horn plates, upon which spring catches are adjusted to hold a rubber or napkin. A broad elastic band passes around the head and is held in place by a tight-fitting slide. It is tightened or loosened without the inconvenience of a buckle.

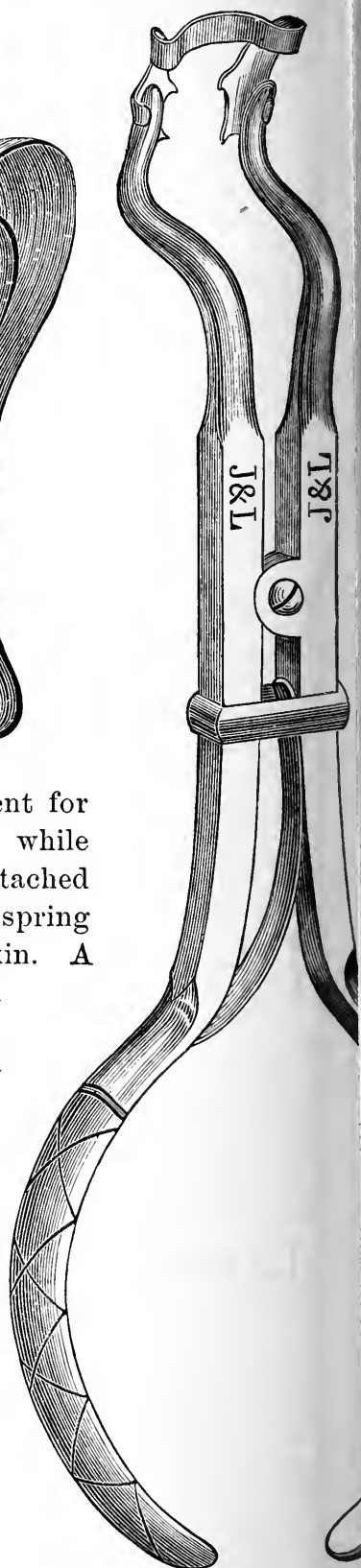
Dentists who have used the holder value it highly.

Price, \$1.00

RUBBER DAM CLAMP FORCEPS.

We here represent a Rubber Dam Clamp Forcep, combining the advantages of Dr. Bowman's and Dr. Allan's patterns. All these forceps have the lock slide, which keeps clamps and forceps extended and ready for use when necessity compels the operator to lay them down momentarily.

Forceps, Nickel plated (see cut) . . . \$2.00



STRAIGHT RUBBER DAM PUNCHES.

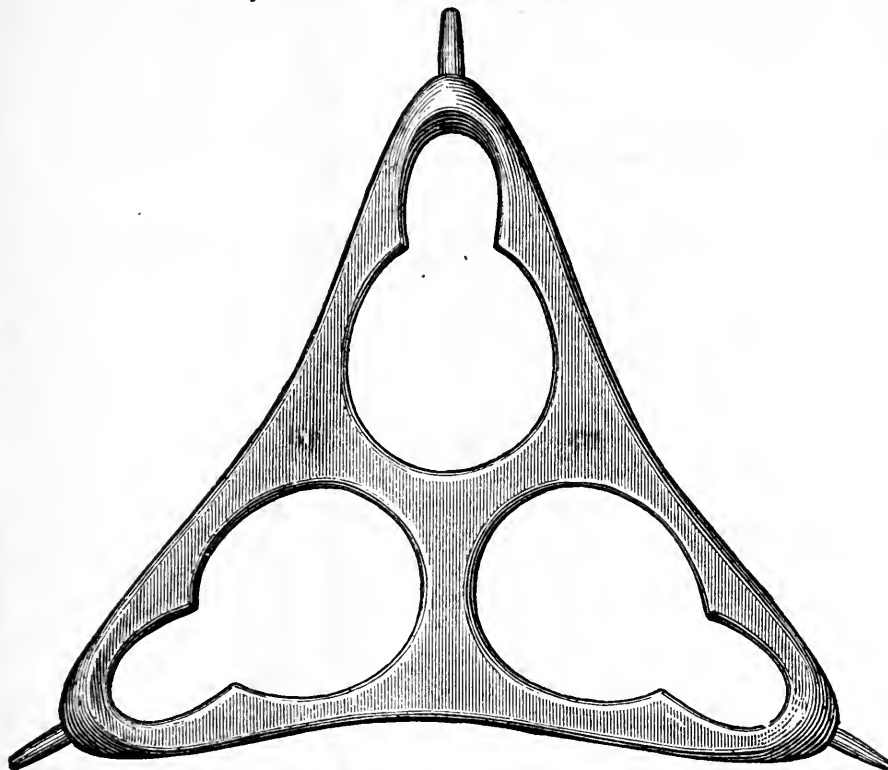
PRICE.

Octagon handles,	:	:	:	Each, \$	.40
Octagon, 1/4 inch handles, ball ends (see cut),	:	:	:	"	.60
1/4 inch steel, engraved handles, Nickel Plated,	:	:	:	"	.50

TRIPLEX RUBBER DAM PUNCH.

Pattern by Dr. Dolbeare.

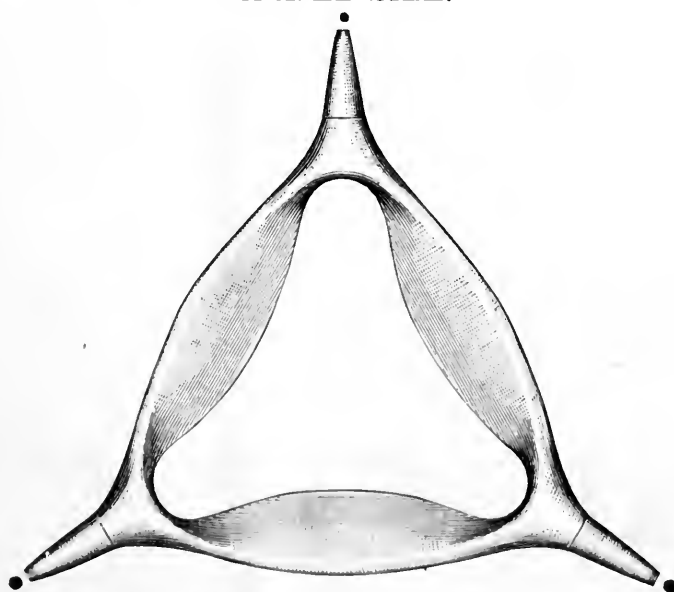
Very effective and comfortable in use.



[Cut exact size of Instrument.]

Price, Nickel Plated, \$1.50

SMALL SIZE.

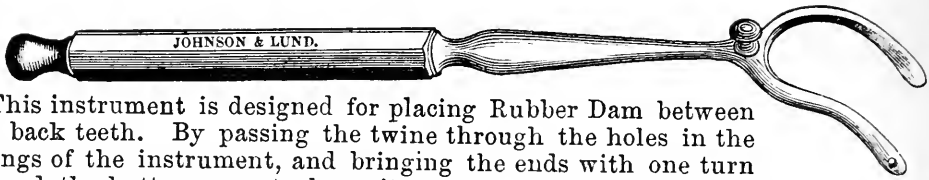


Price, Nickel Plated, \$1.00



Cut exact size of Instrument.

RUBBER DAM APPLIER.



This instrument is designed for placing Rubber Dam between the back teeth. By passing the twine through the holes in the prongs of the instrument, and bringing the ends with one turn around the button, so as to keep it taut, and moving it with a lateral motion, the Rubber will be forced between the teeth.

PRICE.

With $\frac{1}{4}$ inch plain octagon, Steel handle, ball ends (see cut), each,	\$1.25
“ “ “ “ “ “ “ “ “ “ “ “ Nickel Plated (see cut),	1.50

RUBBER DAM WEIGHTS AND SPRINGS.



These weights are intended to be attached to the lower margin of the Dam, when in use, serving to keep it out of the way of the operator.

They are of metal, handsomely nickel plated. The springs are of stiff metal, nickel plated. They are readily attached and removed from the Dam without tearing it.

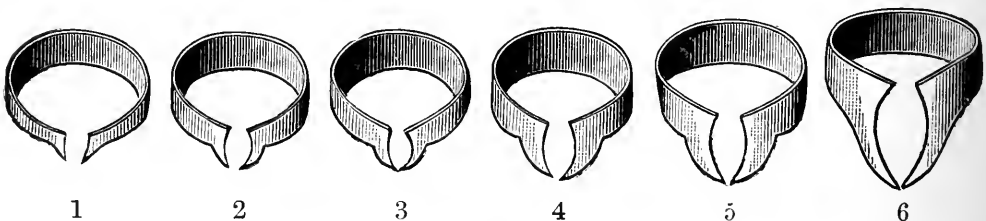
There are three sizes. The small size weighs 1 ounce; the medium size weighs $1\frac{1}{2}$ ounces; the large size weighs $1\frac{3}{4}$ ounce.

Price, with Spring, each, . 40cts.

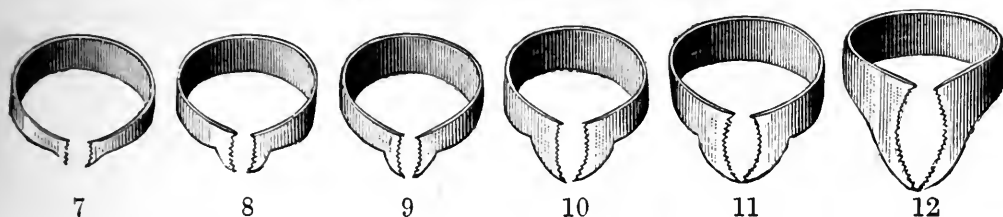
RUBBER DAM CLAMPS.

Nos. 1 to 12, designed for general use. The variety being sufficient for all teeth.

DR. CHAS. F. ALLAN'S SET OF 6, PLAIN.



Dr. Chas. F. Allan's set of 6, Serrated.

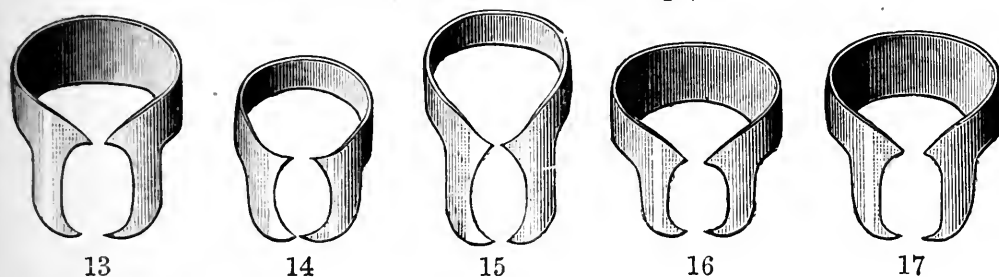


Price, Nickel Plated, Each, 40c.

Nos. 13, 14, 15, DR. CHAS. F. ALLAN'S especial designs for use on lower molars, the inside edges of the clamp being shaped to conform to the necks of these teeth. They are so formed that they entirely clear the tooth upon which they clamp, while the broad flanges keep the Rubber spread.

Nos. 16 and 17, the H. C. Clamps for ladies' and children's molars. They are light, small and very elastic.

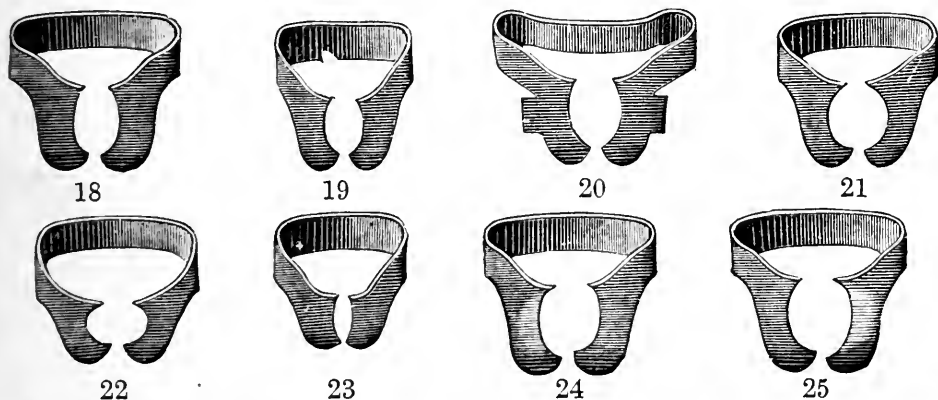
Dr. Chas. F. Allan's Molar Clamps, H. C.



Price, Nickel Plated, Each, 40c.

Nos. 18 to 25. DR. DELOS PALMER'S SET OF EIGHT. Nos. 1 and 2 are Universal Clamps for molars; No. 3 for posterior cavities in isolated molars; No. 4 for wisdom teeth; No. 5 for bicusps; No. 6 for incisors; Nos. 7 and 8, rights and lefts, for cervical cavities in the buccal or lingual faces of molars.

Dr. Delos Palmer's Set of Eight.



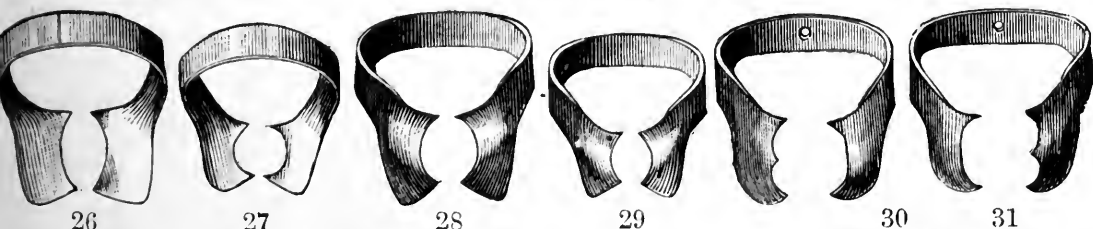
Price, Nickel Plated, Each, 40c.

Nos. 26 to 29, DR. AMBLER TEES' PATTERNS. Nos. 26 and 27, "Festooned" for molars and bicusps, with deeply festooned gums. Nos. 28 and 29, "Broad Flange," for molars and bicusps. The broad flange spreads the rubber considerably. Nos. 30 and 31, DR. W. W. EVANS' BEAKED MOLARS.

Dr. A. Tees' Festooned.

Dr. A. Tees' Broad Flange.

Dr. W. W. Evans' Beaked Molars.



Price, Nickel Plated, Each, 40c.

Nos. 32 and 33, Dr. Robert Huey's—Dens Sapiientiae—for very difficult cases. Nos. 34 to 37, for which require one side to be smaller than others.

Dr. R. Huey's.

Small Irregularity.

Irregularity.



32



33



34



35



36



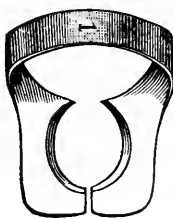
37

Price, Nickel Plated,

Each, 40c.

Nos. 38 to 46, "Reach-Around Clamps," designed for isolated teeth, and in most cases where it is requisite to hold the dam down between teeth in a space caused by removal of adjoining tooth. They can be used to good advantage upon wisdom teeth, the hoop being pressed forward to compress the dam behind the tooth. Nos. 45 and 46 can be used to advantage on bicusps and incisors for holding the dam out of the way of the operator—their long back-set being well adapted to this form of application.

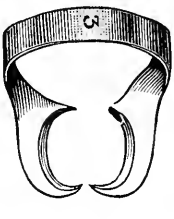
"REACH-AROUND" RUBBER DAM CLAMPS.



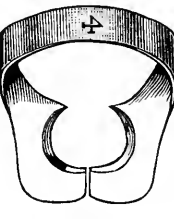
38



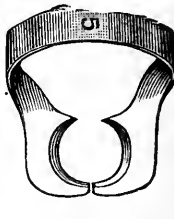
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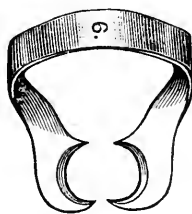
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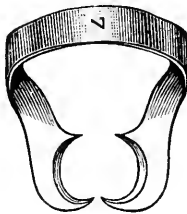
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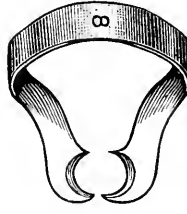
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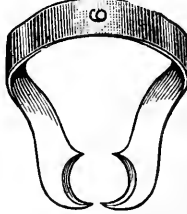
43



44



45



46

Price, Nickel Plated,

Each, 40c.

Nos. 47 to 50, Dr. John W. Holt's, for low down labial cavities upon the neck of a tooth. No. 51, Dr. J. W. Lyder's combination of Dr. A. Tees' Festooned and Dr. W. W. Evans's Beaked Molars, varying from the Evans's Clamp by having beaks on each flange.

Dr. John W. Holt's.

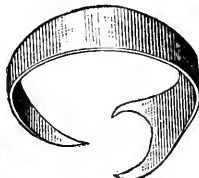
Dr. J. W. Lyder.



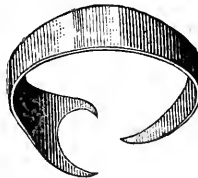
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48



49



50



51

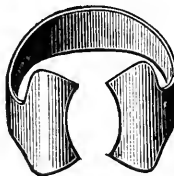
Price, Nickel Plated,

Each, 40c.

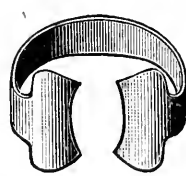
Nos. 52 to 59, DR. H. C. LONGNECKER'S. Nos. 52 to 56, of great value in approximal fillings, as they enable the operator to bring his filling more nearly to completion with Dam and Clamps on than with any other clamps. Nos. 57, 58, 59, the same general shape of beaks as 52 to 56, but with back-set hoops.

No. 60, DR. A. P. SOUTHWICK'S. This is an improvement on Dr. Huey's "Dens Sap.," consisting of a recess for Forceps' Points and sufficient back-set to allow free access for filling.

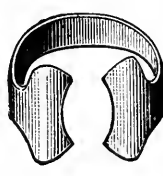
Dr. H. C. Longnecker's.



52



53



54



55



56

Dr. H. C. Longnecker's Back Set.

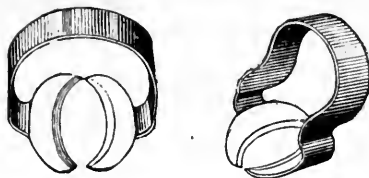


57

58

59

Dr. Southwick's.

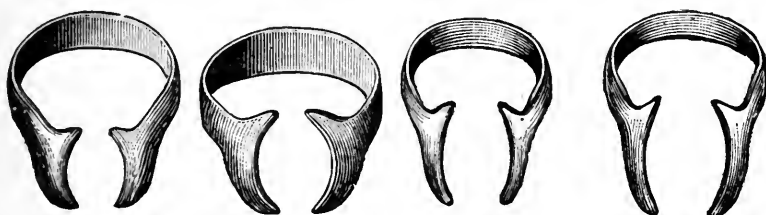


60

Price, Nickel Plated, Each, 40c.

Nos. 61 to 64, Dr. E. C. Moore's. It is claimed for these clamps that they will get down, and stay firmly as placed. They are very neatly made and have every appearance of being less obstructive than other clamps.

Dr. E. C. Moore's.



61

62

63

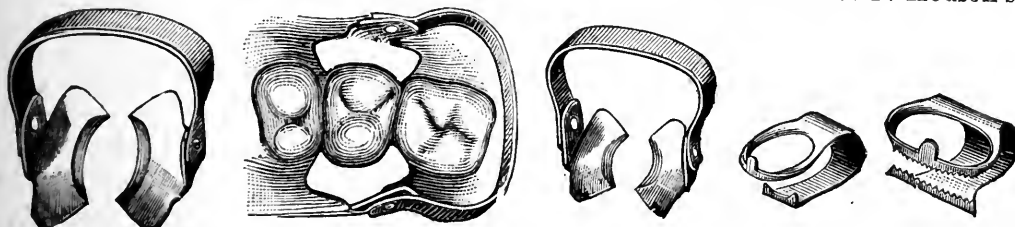
64

Price, Nickel Plated, Each, 60c.

Nos. 67, 68, 69, Dr. W. E. Buckman's Plain Hinged Clamps. The hoop of the clamp can be turned down so as to permit of work at the tooth on which it is placed. Nos. 70 and 71, Dr. J. F. P. Hodson's—for labial or buccal gum cavities.

Dr. W. E. Buckman's.

Dr. J. F. P. Hodson's.



67

68

69

70

71

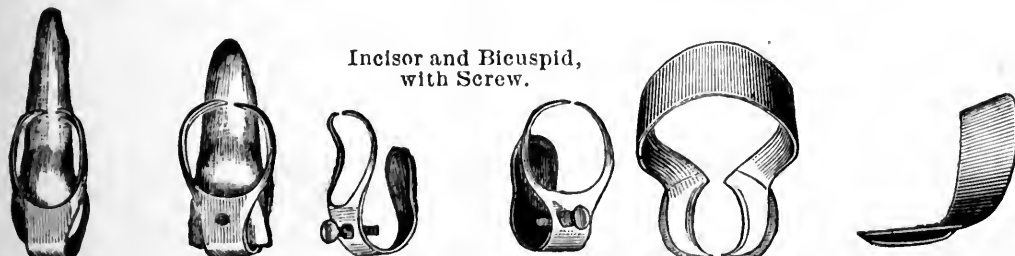
Price, Nickel Plated, Each, 80c.

Nos. 72 to 75, Dr. W. W. Evans's. The clamps are designed for use in filling labial surfaces of incisors, bicusps and cuspids when the cavity is close to or under the margin of the gum. Made in two sizes and with or without regulating screw. The screw serves to tighten the hold in cases where the clamp does not fit securely.

No. 76, Dr. F. Hickman's. This clamp has a double lip. When the rubber is punched, it is applied to the clamp by stretching it over the lip and allowing it to fall into the recess. This is especially adapted to teeth which are decayed down low on one side.

Dr. W. W. Evans's,
without Screw.

Dr. Hickman's.



72

73

74

75

76

Price, 90c. Each.

Price, \$1.25 Each.

Price, \$1.20 Each.

IMPORTANT.

TOOTH POWDER. MOUTH WASH.

To all whom it may concern. If you prefer furnishing your patients with preparations for the Mouth and Teeth under your own label—we make you the following liberal offer: If you will buy *not less* than Six dozen bottles Tooth Powder, or *not less* than Six dozen bottles Mouth Wash at one time, you will be privileged to select any name you desire to sell the goods under, in place of our proprietary names and we will so label the bottles using the selected names in place of either “Doucehaleine” or “Odontophile” as the case may be, and substituting your name and address as proprietors, in place of our own, without any additional charge.

JOHNSON & LUND.

PRICES.

“DOUCEHALEINE.”

A MOST DELIGHTFUL MOUTH WASH.

In Bottles Fitted with Fine Metal Top.

	Per 1 doz.	Per 3 doz.	Per 6 doz.	Per 12 doz.
Size No. 1	\$4.00	\$10.80	\$20.40	\$38.40
“ 2	2.00	5.40	10.20	19.20

“ODONTOPHILE.”

AN ELEGANT TOOTH POWDER.

In Bottles fitted with Fine Metal Top.

	Per 1 doz.	Per 3 doz.	Per 6 doz.	Per 12 doz.
Size No. 1	\$4.00	\$10.80	\$20.40	\$38.40
“ “ 2	3.00	8.10	15.30	28.80
“ “ 3	2.00	5.40	10.20	19.20

JOHNSON & LUND,

620 Race Street, Philadelphia.

514 Wabash Avenue, Chicago.

POSSESSES THE GREATEST FREEDOM FROM SHRINKAGE.

IT RETAINS ITS BRIGHTNESS.



oz. Troy.
**EXTRA TOUGH
GOLD
AND
PLATINA ALLOY**

A notable Tooth Saver.

The proportions of Gold and Platina in this Alloy with the Combination of Silver, Tin, &c., cause it to harden quickly and to maintain its edge strength. Use as little Mercury as will make a stiff plastic filling, and place in cavity without washing.

JOHNSON & LUND,

SOLE AGENTS,

620 Race St., Philada.

514 Wabash Ave., Chicago.

IMPERVIOUS to the SECRETIONS of the MOUTH.

WORKS WITH GREAT PLASTICITY AND PACKS DENSELY.

PRICES.

Per ounce	\$3 00
" half ounce	1 50
" two ounces purchased at one time	5 40
" three " " "	7 65
" four " " "	9 75
" five " " "	11 75
" ten " " "	20 00

When money accompanies the order, the Amalgam will be sent postage free.

Virgin White Alloy for Front Teeth.

Trade Mark.



The prominent qualities of this Alloy are its WHITENESS and FREEDOM FROM SHRINKAGE. Fillings made of this Amalgam, in tubes five or six times the diameter of those usually employed in the "leakage test," with blue or purple ink, give no perceptible indications of permeation of fluid. Though designed especially for front teeth, yet it will stand mastication well anywhere in the mouth. For crown cavities, however, we recommend the EXTRA TOUGH GOLD AND PLATINA ALLOY, as that is made with especial regard to edge-strength.

PRICES.

Per ounce	\$ 2 00
" half ounce	1 00
" two ounces purchased at one time	3 80
" three " " "	5 40
" four " " "	6 80
" five " " "	8 00
" ten " " "	15 00

When money accompanies the order, the Amalgam will be sent postage free.

It Retains its Brightness.

It works with great Plasticity, and packs densely.

Oz. Troy.

Extra Amalgam.

GOLD AND



PLATINA  **ALLOY.**

TRADE MARK.

TRADE MARK.
JOHNSON & LUND,

SOLE PROPRIETORS,

620 RACE ST., PHILADELPHIA.

514 WABASH AVE., CHICAGO.

It possesses the greatest possible freedom from shrinkage.

Impervious to the Secretions of the Mouth.

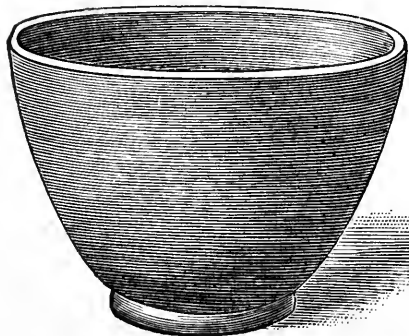
PRICES.

One	Ounce Package.									\$	3	00
Two-thirds	"	"	.	.	.	.	.	.	.		2	00
One-third	"	"	.	.	.	.	.	.	.		1	00
Two Ounces,	purchased at one time.		.	.	.	.	.	.	.		5	40
Three	"	"	"	"	.	.	.	.	.		7	65
Four	"	"	"	"	.	.	.	.	.		9	75
Five	"	"	"	"	.	.	.	.	.		11	75
Ten	"	"	"	"	.	.	.	.	.		20	00

When money accompanies the order, the Amalgam will be sent postage free.

REDUCTION IN PRICE.

RUBBER BOWL FOR MIXING PLASTER.



These Bowls are made of soft rubber, almost one-eighth of an inch thick. They cannot be broken. Their sides can be pressed together so as to form a lip or spout for pouring out soft plaster. The plaster that remains in them and becomes set can be thoroughly crushed and removed by squeezing the sides of the bowl together.

Inside measurement, $4\frac{1}{4}$ inches in diameter
by $3\frac{1}{8}$ inches in depth.

PRICE, 60 CENTS EACH.

Continuous Gum-Work Made Easy

DR. TEES'

LILIPUT FURNACE

FOR CONTINUOUS GUM-WORK.

This furnace is the result of experiment on the part of Dr. Tees, to get the requisite amount of heat, with the expenditure of the least amount of fuel. Although fifteen inches high, twelve inches wide, and eight inches deep, yet the heat of the muffle is intense enough to fuse the enamel of the teeth again, after being *etched*; and, excepting the hottest days of summer, the laboratory will not be uncomfortably warm.

With the Liliput Furnace, with the proper and convenient appurtenances accompanying it, with one kind and size of fuel, and with the management of the Furnace heats, heretofore considered the most difficult part of the work, reduced to a clock-work system, a novice, by careful attention to the directions and instructions, may be successful with his first set of Continuous Gum.

Instructions in pamphlet form, for "Dr. Tees' Simplified System of Mounting and Mending Continuous Gum-Work," accompany each Furnace.

With the Furnace are two muffles, one ash-pan, one slide, a poker, a pair of tongs, two coke-screens, and one-half pound of kaolin.

Price of Furnace, with Necessaries as above, \$30.

Boxing, \$1 extra. Extra muffles, 75 cts. each.

Body	\$1 50 per 1 oz.
Light Colored Gum Enamel	1 25 per 1/2 oz.
Medium Colored Gum Enamel	1 25 per 1/2 oz.
Dark Colored Gum Enamel	1 25 per 1/2 oz.

AMBLER TEES, D. D. S.,

548 NORTH SEVENTEENTH STREET, PHILADELPHIA.

KNOXVILLE DENTAL DEPOT,

No. 11 Asylum Street, Knoxville, Tennessee,

Where may be found a Complete Assortment of Dental Supplies. I keep all Dental Goods and Instruments Made and Handled by

JOHNSON & LUND.

M. M. HARRIS, Proprietor.

IMPERIAL VARNISH.

FOR VARNISHING PLASTER IMPRESSIONS AND FOR
GENERAL LABORATORY USE.

No oil, soap or coloring material needed with this varnish, as it takes the place of all.

Prepared by S. ELDRED GILBERT, D. D. S.

Put up in wide-mouthed two-ounce bottles.

Price per Bottle, - - - - - - - - - -25 Cents.

JAMES M. ERNEST,

MANUFACTURER OF

DENTISTS' FILES

of all descriptions,

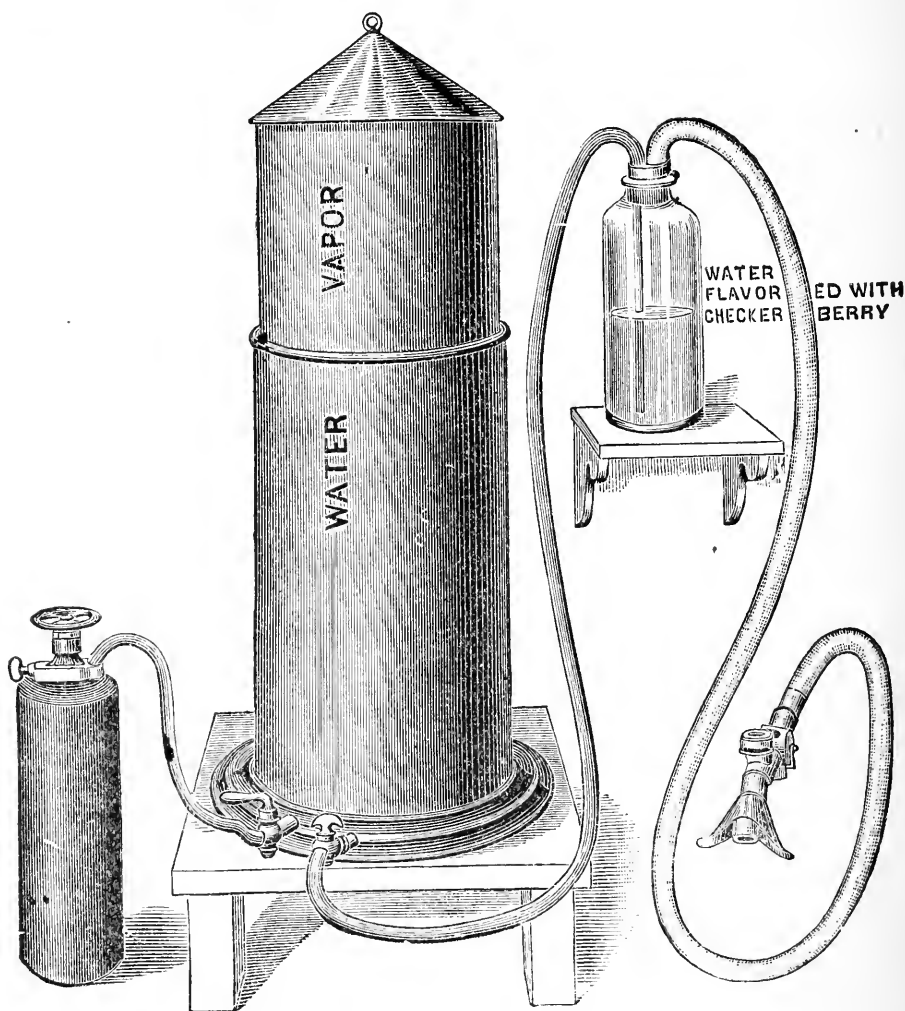
No. 2121 Sergeant Street, Philadelphia.

A New Discovery!

A New Discovery!

FAR SUPERIOR TO LIQUID NITROUS OXIDE!

The Vegetable Anæsthetic.



It is without any of the objectionable features peculiar to other Anæsthetics on the contrary it builds up the tissues, quickens the circulation and adds oxygen to the system. The properties of the herbs from which it is manufactured are hypnotic, diaphoretic, stimulative and antispasmodic. The patient awakens from the sleep refreshed and cheerful, and reports the sensations and effects as most agreeable. It is given to the youngest children, the most sensitive persons, as well as the aged and enfeebled, and no injury has resulted, or in the nature of the Anæsthetic can result from its inhalation.

As an assurance of the safety and perfect reliability of this new Vapor, we publish the following recommendation from physicians and dentists who have been, and are now, using the new Vegetable Anæsthetic:

"We have used the Vegetable Anæsthetic since January 1886—over a year—*exclusively*, in our practice, both for the extraction of teeth and minor operations in surgery. We have administered it repeatedly in heart disease, severe lung diseases, Bright's disease, etc., etc., where the patients were so feeble as to require

FRIZZEL & WILLIAMS, Dentists,
Lee Hall, Lynn, Mass.

B. L. KNAPP & CO.,

161 TREMONT STREET, BOSTON, MASS.

Have Constantly on Hand a Large Stock of Johnson & Lund's IMPROVED ARTIFICIAL TEETH, EXTRA TOUGH RUBBER, EXTRA AMALGAM, ONYX CEMENT, LATHES, VULCANIZERS, IMPRESSION CUPS, &c., &c.

Give them a call, and you will receive a prompt and satisfactory response.

A. W. SEE & CO.

1288 BROADWAY, NEW YORK.

BRANCH DEPOT:

374 Fulton St., Brooklyn, N. Y.

Dealers in JOHNSON & LUND's Improved Artificial Teeth, Extra Tough Rubber, Crimson-Brown Rubber, Light and Dark Red Rubber, Extra Amalgam, Onyx Cement, Johnson & Lund's Lathes, Johnson & Lund's Vulcanizers, Impression Cups, and a full line of Dental Goods generally.

Dentists will do well to call upon them before purchasing elsewhere.

EUREKA CEMENT

Will bring out a perfect joint in Gum sections of rubber plates every time. Money will be refunded to any one who, after using according to the new directions, fails to accomplish what we advertise. No office right to buy. A sure preventive for dark or spread joints. This Cement is prepared expressly for this purpose, and cannot be used for filling teeth. Since the introduction of our Cement, a manufacturer has bought a little carmine at a drug store, colored the powder of his Cement and makes the assertion that he has made it for years. We were the first to prepare a Cement for this purpose. Our packages contain eight times the amount of material sold by other firms.

Price, \$1.00 per package.

BUCK & CO.,

Brockport, N. Y.

FOR SALE BY

JOHNSON & LUND,

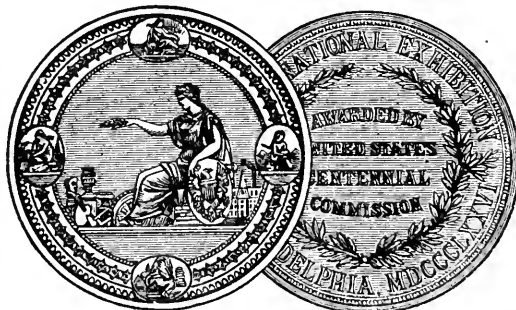
620 RACE ST., PHILADELPHIA.

514 WABASH AVE., CHICAGO, ILL.

CHAS. ABBEY & SONS, DENTISTS' FINE GOLD FOIL.

SOFT, OR NON-ADHESIVE, AND ADHESIVE.

ALL FROM ABSOLUTELY PURE GOLD.



230 Pear Street, Philadelphia.

Hawes's Moulding Flasks.

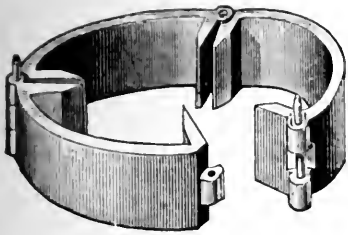


Fig. 1.

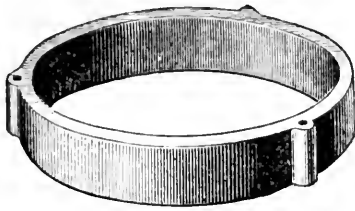


Fig. 2.

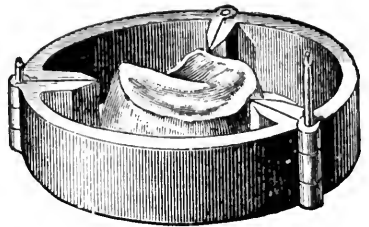
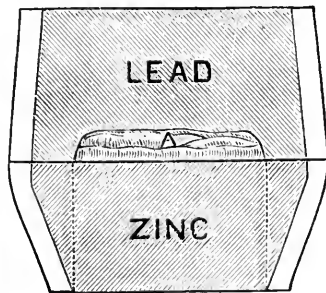
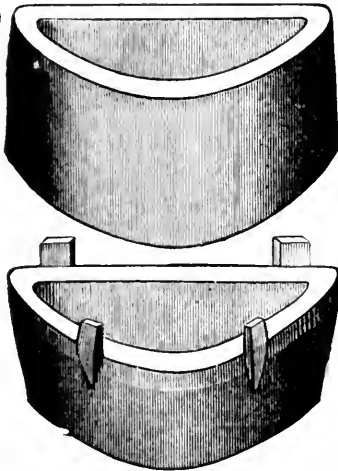


Fig. 3.

Fig. 1 shows the lower section of the flask, partly open. Fig. 2 shows the upper section. When in use, the lower section is closed and fastened by a pin, and the Plaster Model placed in it, as represented in Fig. 3.

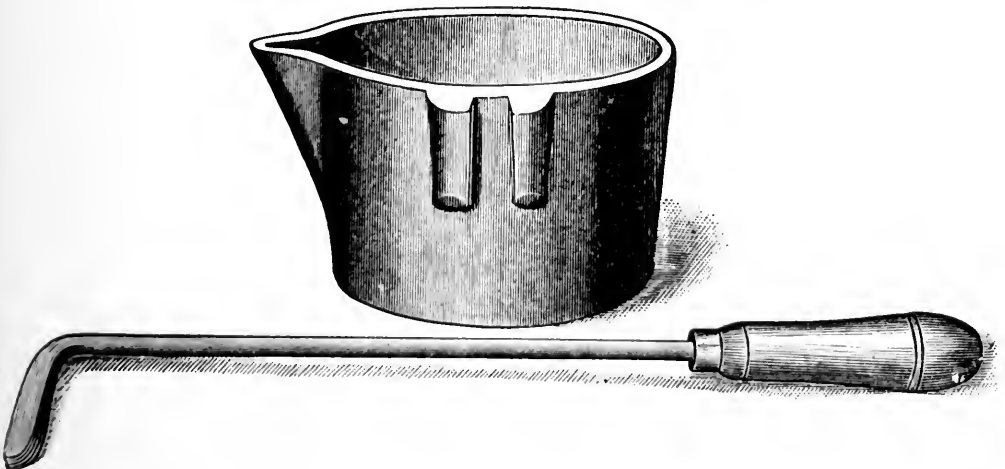
Price, \$3.00

Bailey's Flasks for Making Metal Dies.



Per Pair, either Small or Large, 50c.
Per Set, two Sizes, Small and Large, \$1.00
A set consists of one pair, small size, and one pair large size.

Ladles With Detached Handles.



The above Ladles are made in three sizes; one handle will fit any Ladle and can be removed when the Ladle is placed on the fire.

No. 1, 5 in. diameter x 3 in. deep, 40c. No. 2, 4½ in. diameter x 3 in. deep, 25c. No. 3, 4¼ in. diameter x 3 in. deep, 25c. Handles of wrought iron, 25c. Two Ladles, No. 2 and 3 and one handle, 75c.

DOUBLE-END RIGHT AND LEFT GOLD PLUGGER.

Suggested by Dr. E. G. Douglass, La Peer, Michigan.



Price, engraved handle, nickel plated, Each, 75c.

THE WOODSON DOUBLE-END AMALGAM PLUGGERS.

Suggested by Dr. E. W. Woodson, Parsons, Kansas.



Price, engraved handle, nickel plated, Per set, \$2.25. Each, 75c.

THE CHUPEIN DOUBLE-END AMALGAM PLUGGER



The above set is especially adapted to filling approximal cavities. They can be used right and left.

Price, engraved handle, nickel plated, Per set, \$1.50. Each, 75c.

WATTS'
CRYSTAL GOLD.
\$4.00 per one-elgth ounce.
JOHNSON & LUND.
Philadelphia and Chicago.

NERVE BROACHES,
THE BEST,
Assorted Sizes,
75 CTS. - PER DOZEN.

NERVE PASTE.
ARSENIC and CREOSOTE.
35 Cents per Bottle.

SPUNK.
FOR DRYING OUT CAVITIES.
Price, per oz.,..... 20
" in bulk, per lb.,...\$1 25

SEPARATING FILES.
*J. M. EARNEST'S MAKE ARE THE
VERY BEST without doubt.*
No. 000, per dozen,.....\$1 25
All other numbers, per dozen,.... 1 00
JOHNSON & LUND.

THERMOMETERS
For Vulcanizers,
THE MOST RELIABLE.
75 CENTS EACH.

PHENOL SODIQUE,
50 Cents per Bottle.

~~Gluten Flour and Special Diabetic Food
are invaluable waste repairing Flours, for
Dyspepsia, Diabetes, Debility, and Children's
Food. No Bran, mainly free from Starch.
Six lbs. free to physicians and clergymen
who will pay express charges. For all family
uses nothing equals our "Health Flour."
Try it. Samples free. Send for circulars
to FARWELL & RHINES, Watertown, N. Y.~~

Orange Wood, for Wedging.
Per bundle, 10 Cts.

DENTAL FLOSS SILK.
Price, plain, per dozen, . 90 | Price, waxed, per dozen, \$1 15
" " " spool, . 15 | " " " spool, 15
JOHNSON & LUND, Philadelphia and Chicago.

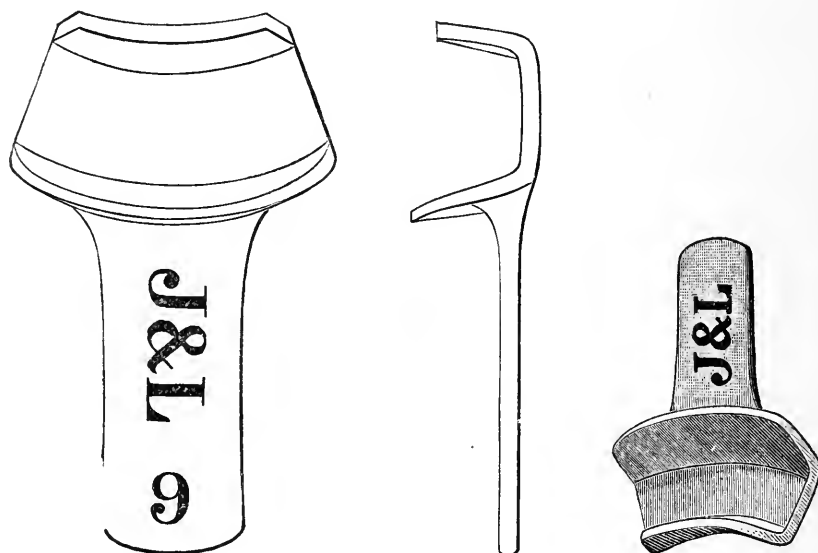
FRENCH
Separating Files,
"FROIDS,"
Per dozen,.....\$1 25

Shellac Sticks,
FOR
MOUNTING DISKS,
Per box,.....25c.

MEDICINE BOTTLES.
A small square glass bottle, with ground glass stopper, for Office Prepara-
tions; the stopper is flat on top, to receive a label.
Per dozen,.....80 c.
Each,......07 c.

BRITTANIA IMPRESSION CUPS.

PARTIAL UPPER CUP, for one or two teeth. Very useful in Bridge Work or Pivoting.

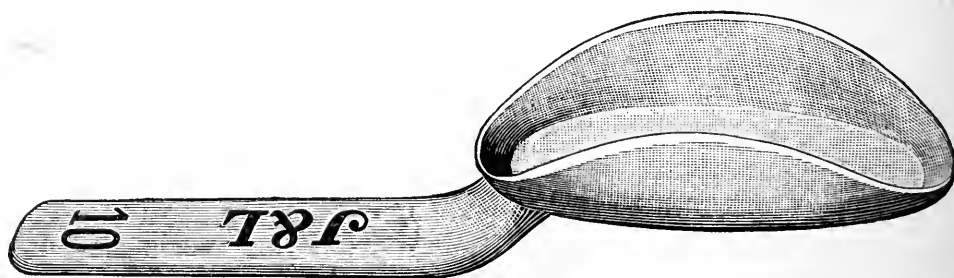


Price, each, 20 cents.

PARTIAL UPPER OR LOWER CUP.

DR. L. M. Matthews' Pattern.

This is a universal Partial Cup, being suited to Partial cases of every description in either jaw.



Price, each, 25 cents.

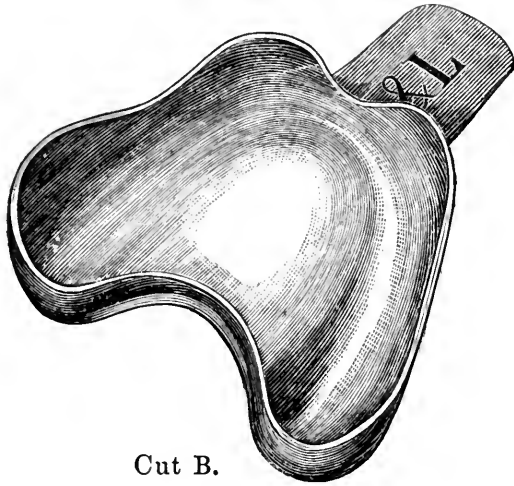
UPPER IMPRESSION CUPS.

Specially Adapted for Plaster Pattern of Dr. A. P. Southwick.

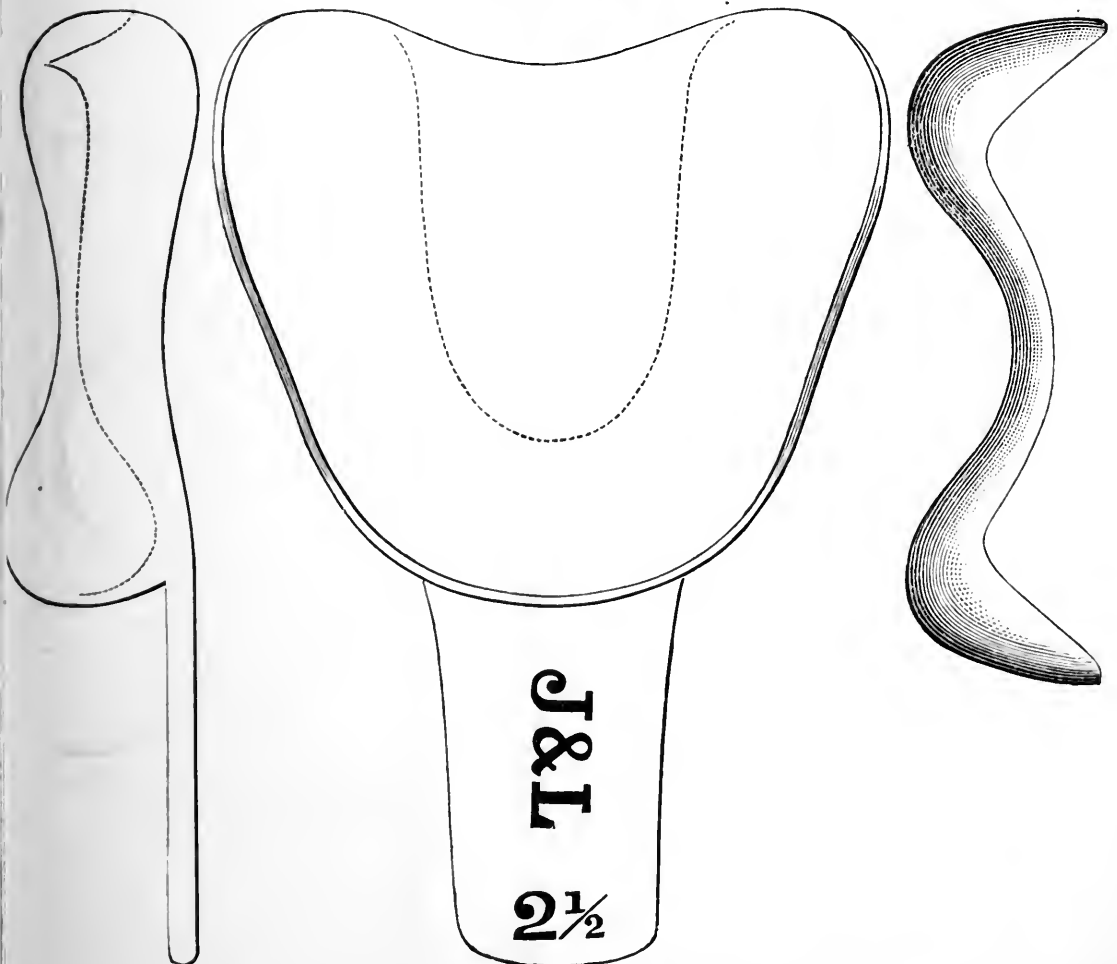
Cut B illustrates a set of three—Nos. $2\frac{1}{2}$, $3\frac{1}{2}$ and $4\frac{1}{2}$ —for full upper plates, with the palatine edges somewhat raised, which prevent the plaster slipping from the cup.

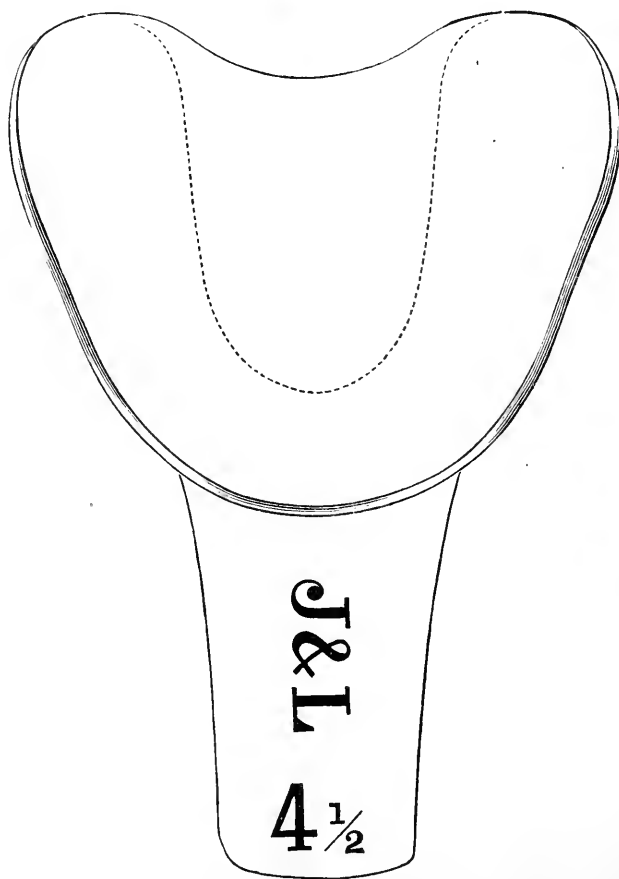
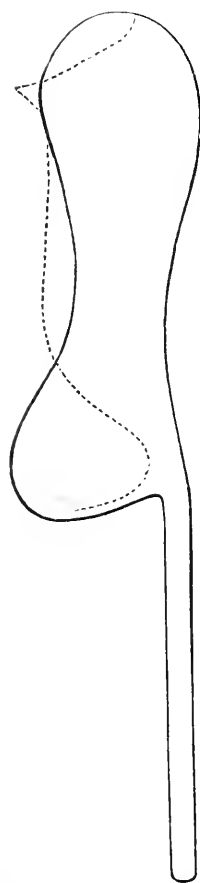
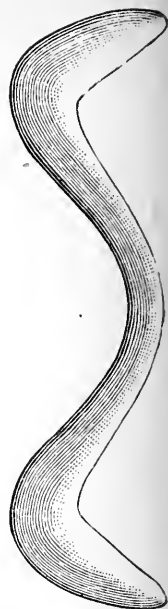
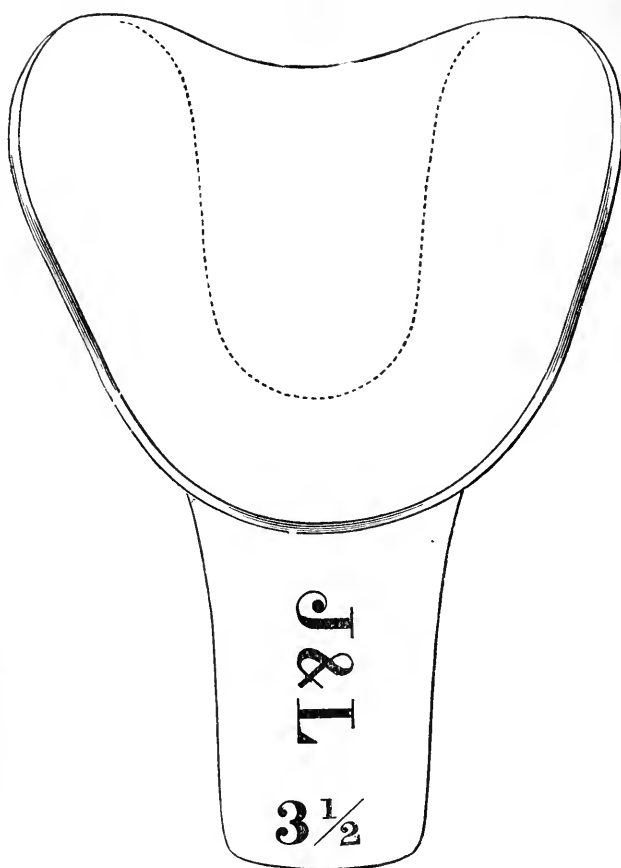
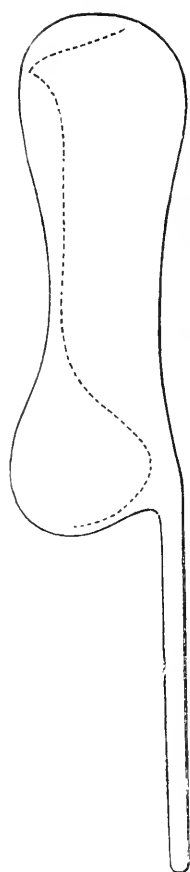
Price, Each Cup,

25 Cents.



Cut B.



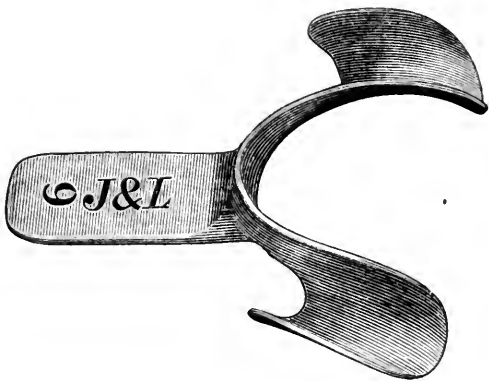


LOWER IMPRESSION CUP.

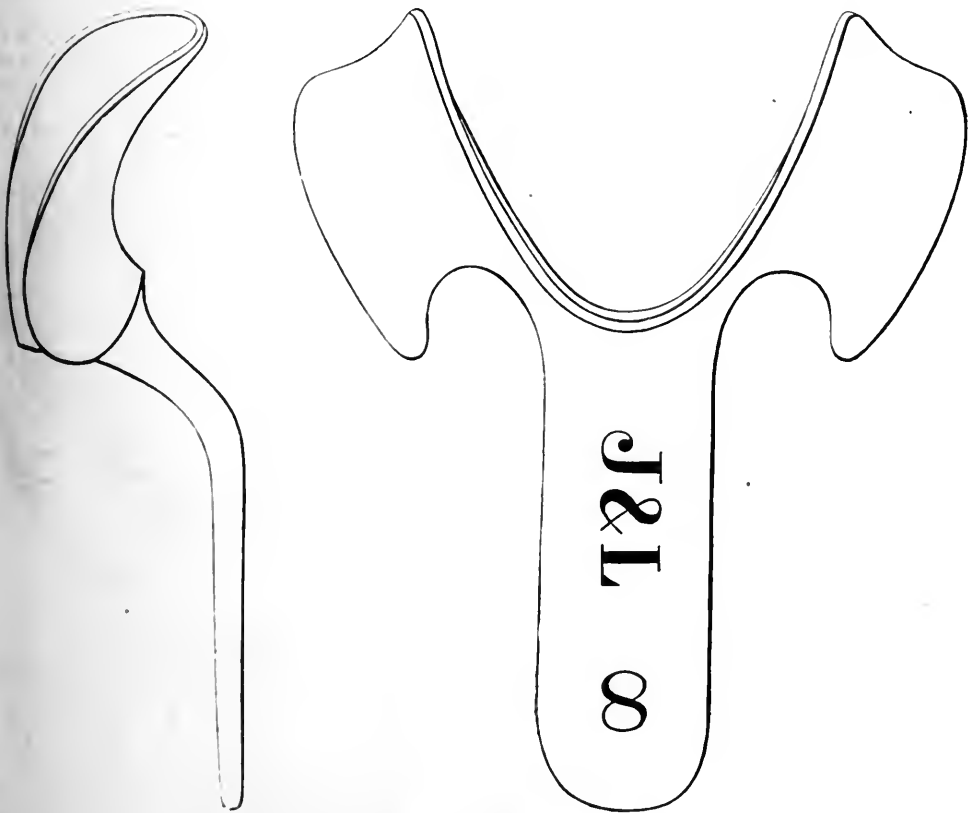
Pattern of Dr. C. F. Rich.

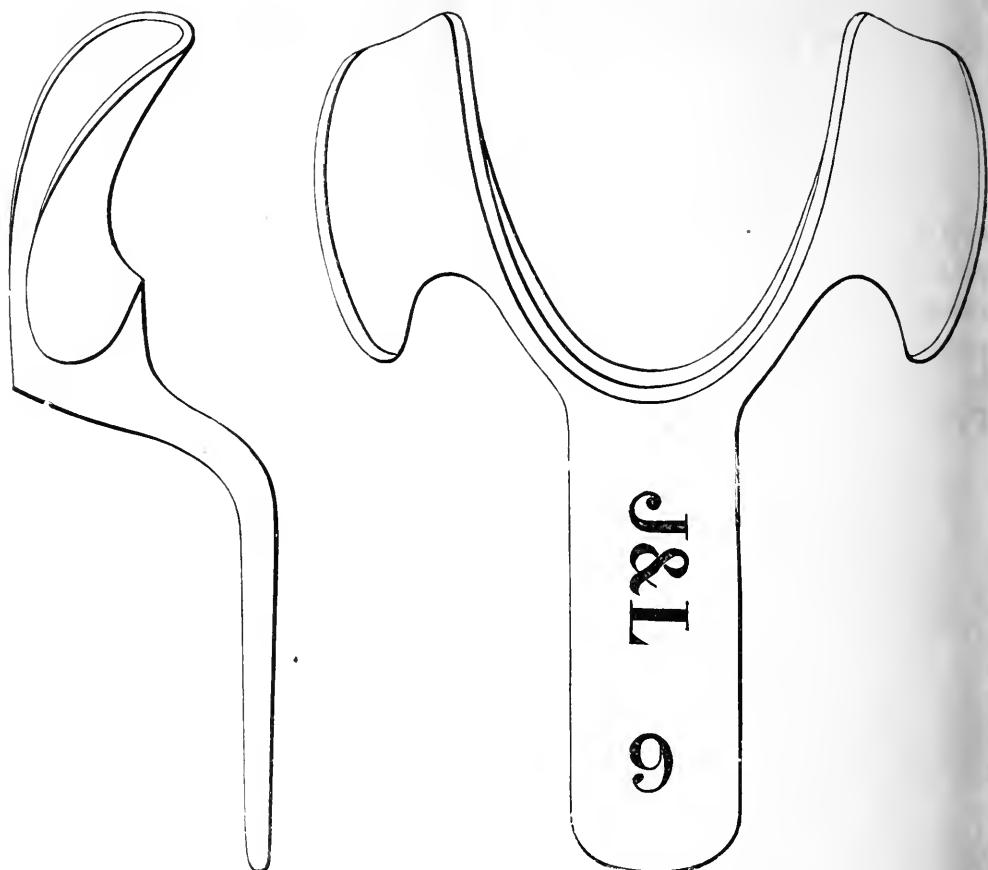
Cut C illustrates Dr. C. F. Rich's form of cup. The rim of the cup adjoining the handle is cut away, so that the cup, after being placed in the mouth, charged with material for impressions ready for use, may be pressed downward and forward against the front teeth, procuring a perfect impression of undercuts.

Price, Each, 25 Cents.



Cut C.



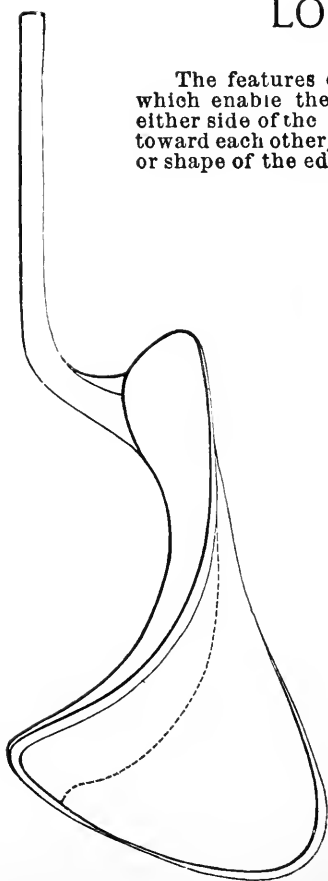


LOWER IMPRESSION CUP.

Professor Henry J. Dorr's Pattern.

The features of remark in this Cup are the Posterior Lingual Wings which enable the operator to obtain an accurate impression of the jaw on either side of the tongue. These wings can be spread apart or brought toward each other or twisted, or cut away to adapt the cup to nearly any size or shape of the edentulous lower jaw.

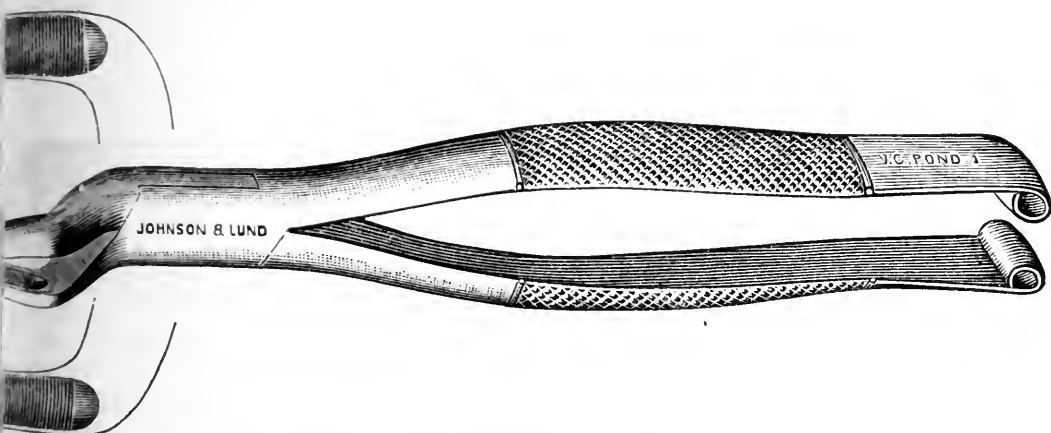
Price, each, 25 cents.



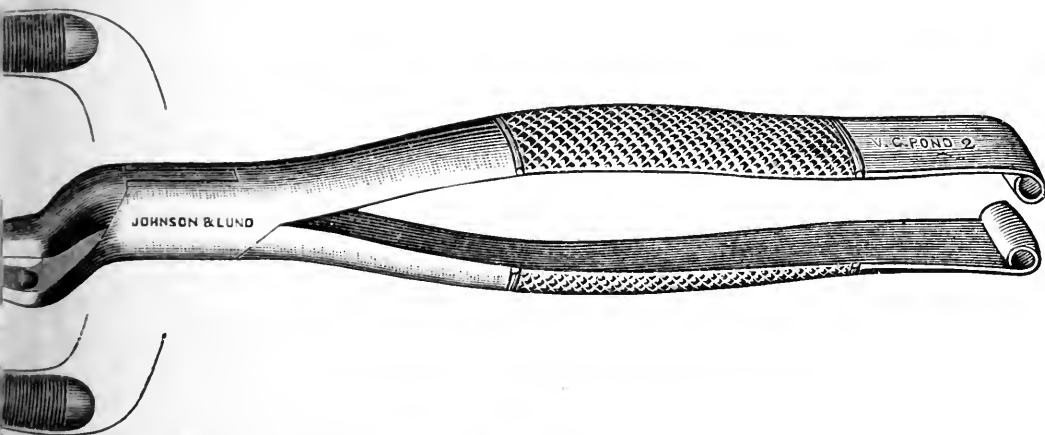
Dr. V. C. Pond's Set of Forceps.

The ends of the handles are rounded to fit the palm of the hand, so that the beaks can be readily forced between the tooth and the alveolus. All are made with oval joints, nickel-plated.

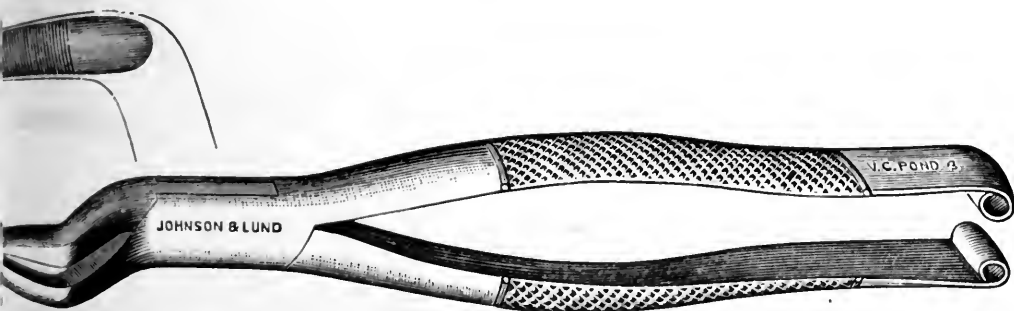
Price, Each, \$2.25



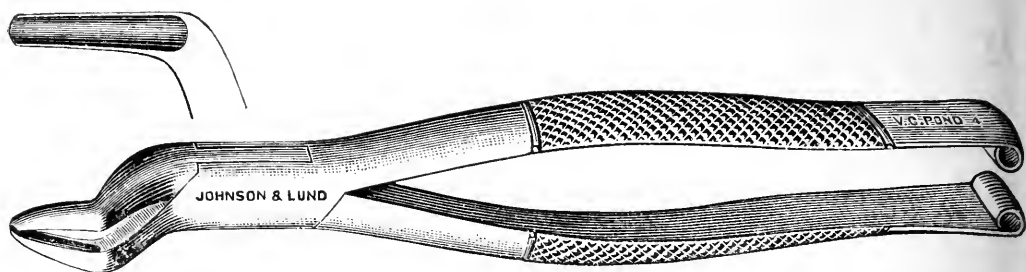
No. 1. Right Upper Molar.—V. C. Pond's.



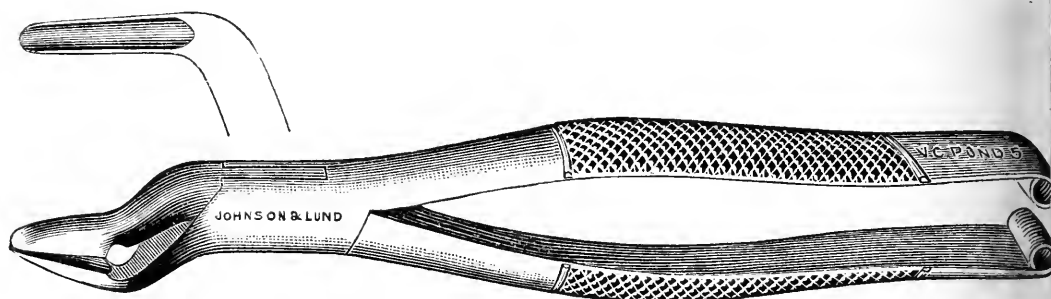
No. 2. Left Upper Molar.—V. C. Pond's.



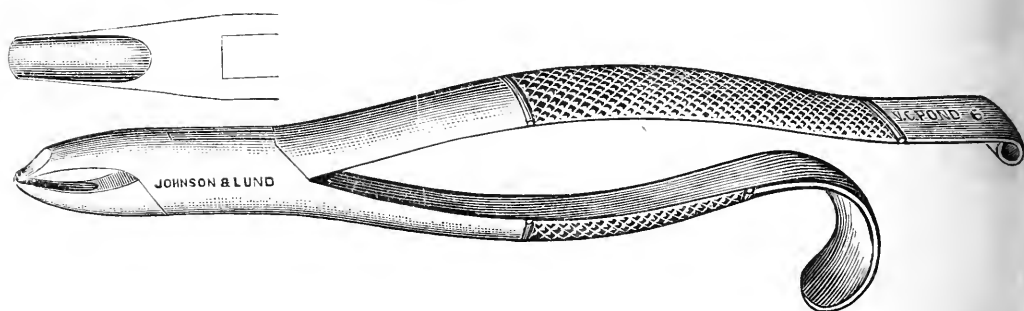
No. 3. Upper Wisdom, Right and Left.—V. C. Pond's.



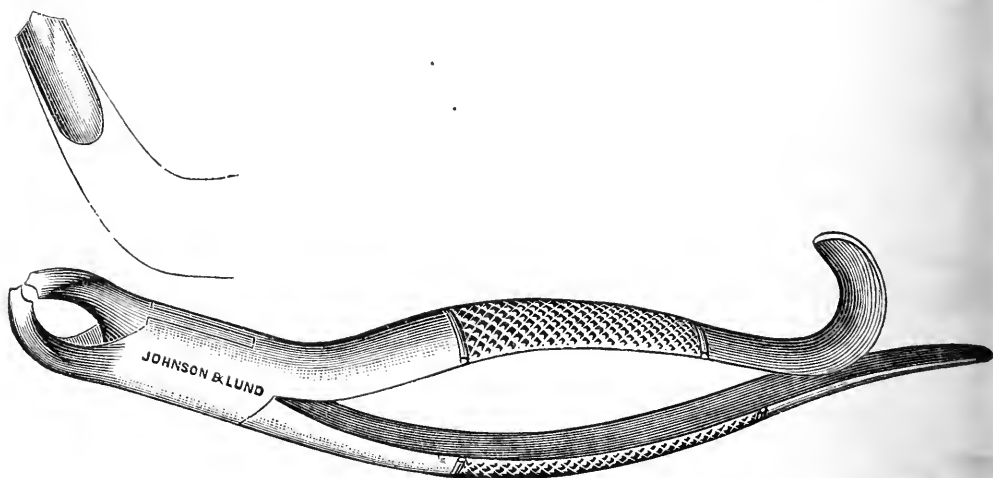
No. 4, Bayonet Shape, Bicuspid and Lateral.—V. C. Pond's.



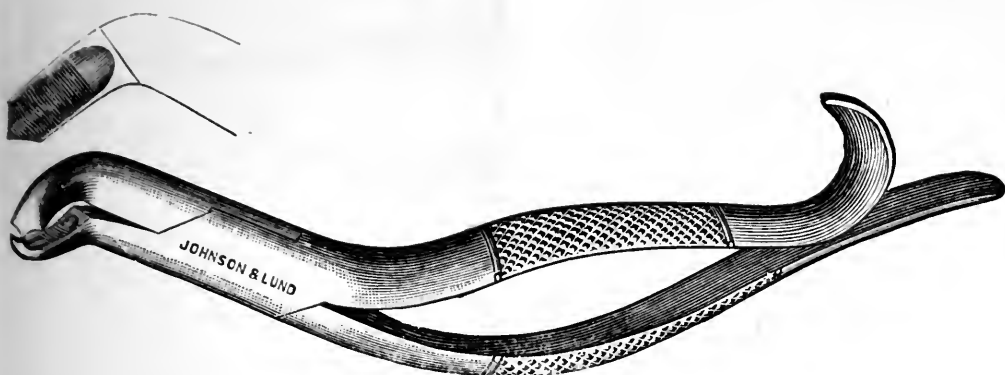
No. 5, Bayonet Shape, upper alveola root.—V. C. Pond's.



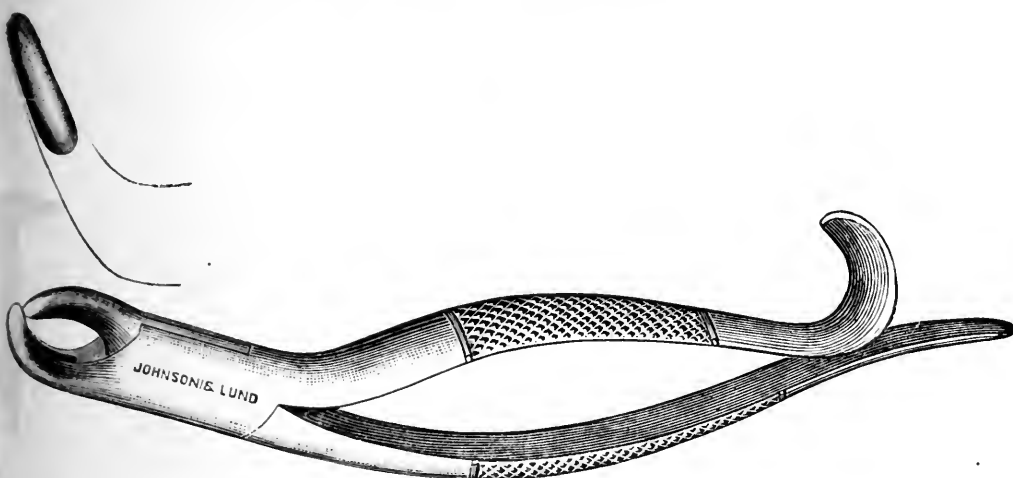
No. 6, Upper Central.—V. C. Pond's.



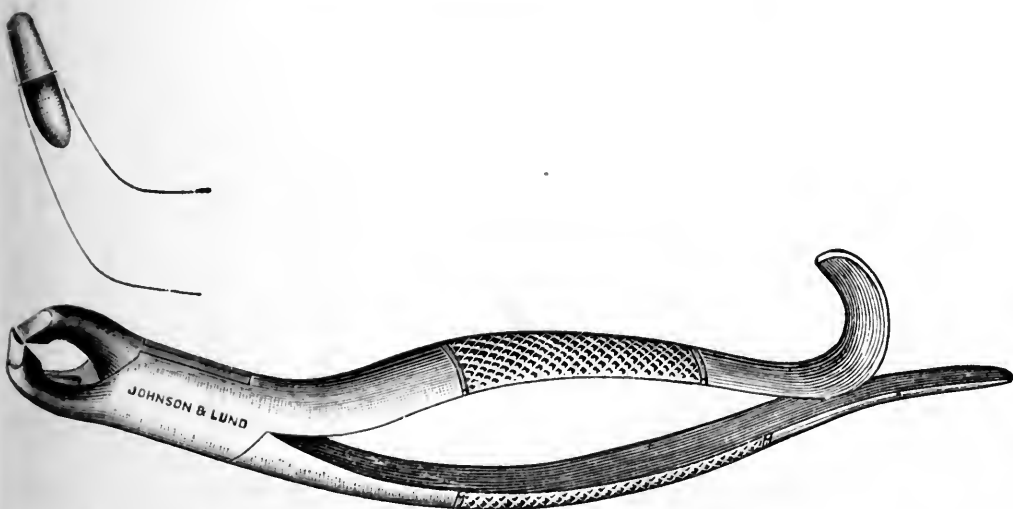
No. 7, Lower Molar, either side.—V. C. Pond's.



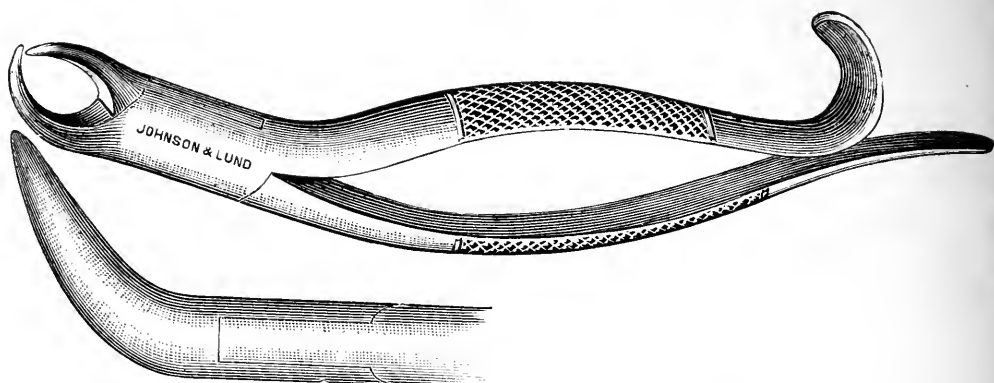
No. 8, Lower Wisdom, either side.—V. C. Pond's.



No. 9, Lower Root.—V. C. Pond's



No. 10, Lower Incisor, Cuspid and Bicuspid.—V. C. Pond's.



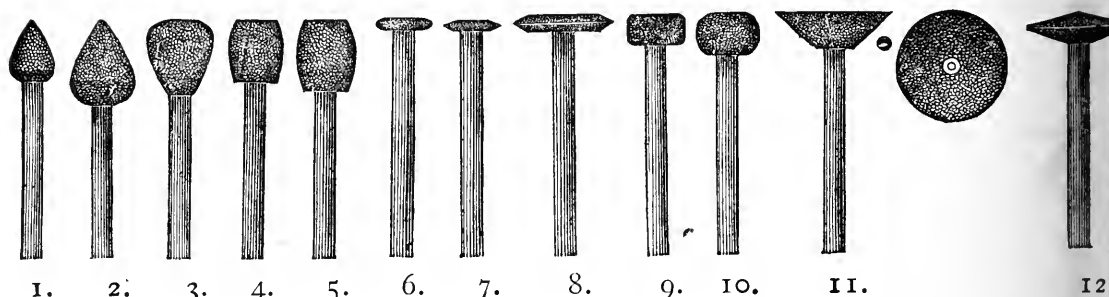
No. 11, Lower Molar, Cow Horn, either side.—V. C. Pond's.

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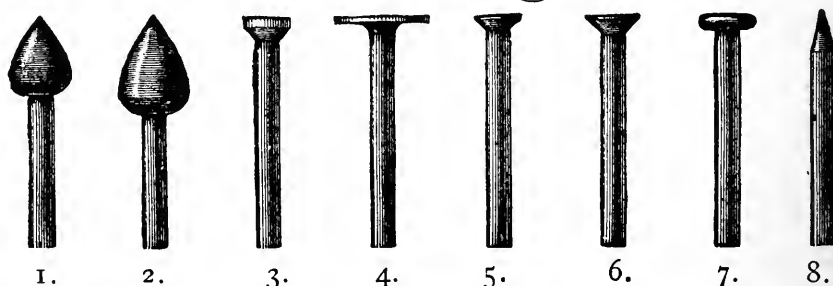
Dr. A. L. Northrop's designs.

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" mounted on mandrels,	-	-	-	-	" "	1.25
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T H E

Dental Office and Laboratory.

THIRD SERIES.

VOL. I.

PHILADELPHIA, OCTOBER, 1887.

No. 4.

VULCANITE WORK.

BY DR. THEO. F. CHUPEIN,

Concluded from page 59, Vol. I No. 3.

By far the most artistic piece of work may be constructed with plain teeth, using pink rubber to imitate the gums. By the use of plain teeth the operator is not trammelled in the arrangement of the teeth as he is with gum section blocks; for he can protrude this tooth, or recede that; he may imitate an irregularity with this or leave out a tooth to disarm suspicion by the apparent loss of a tooth in that. In a thousand ways can the vagaries of nature be imitated and present a denture which is as close an imitation to nature (as far as the teeth go) as is possible. True it is that manufacturers have not yet been able to produce an article of pink rubber that is the exact imitation of the color of the natural gum tissue, yet experiments are strongly tending in this direction, and great improvements in color have been accomplished. On the other hand, if we consider how little of the gum shows in artificial sets, with the large majority of cases, this is no great drawback against its use. Another object gained in the employment of plain teeth with pink rubber gums, is the absence of the joints between the blocks. It requires exceedingly-nice work to fit these joints so closely as to prevent the oozing of the rubber through them, even with the utmost precaution, and when this is not accomplished, and the patient shows the gum in laughing or talking, the case is known at once as being artificial, independently of the stiff "ear of corn" expression which block section teeth nearly always have.

One of the principal objections to the use of plain teeth with pink rubber gums lies in the liability of the red rubber cropping out on the front, and thus marring the finish of the work. Yet, with care, this can be avoided. We purpose to give instructions in the manner of packing such cases.

PACKING A CASE WITH PINK RUBBER GUMS.

The case being flaked with plain teeth, in the same manner as described for flaking with gum section teeth, and the flask parted and wax removed as before described, that part of the flask containing the teeth is set over a stove or in an oven to dry thoroughly. We know of no better adjunct to the laboratory for general purposes than the Bunsen burner and basket.

It will be found admirable—where gas is available—for vulcanizing, for boiling water, for melting tin, or fusible alloy for dental plates, and also to heat the flask for packing a case with pink rubber. For this purpose the flask containing the teeth is placed on the basket, (over which a tin plate or round iron grating is put) and the plaster will be heated. The pink rubber is cut up into small pieces, about twice the size of a duck shot, and put on a piece of paper or in a box cover. Other pieces about a quarter of an inch wide by a half-inch long are also cut up and placed separately. The flask being well heated the gas is extinguished, when a towel, pad, or old rag is placed on the flask to prevent it from burning the hands. Beginning on one side, the rubber is taken up one piece at a time on the point of a small thin excavator, while with the left hand and another excavator, bent at nearly right angles, the teeth are held in place. The first piece of rubber is carried between the first and second molar and packed well into place; piece by piece is added to this, going from tooth to tooth all around, and covering all surfaces of the tooth except that from which the pins project, until all the spaces between the teeth are well filled. If the flask gets cold before the whole case is packed, the gas should be again lighted and the flask reheated. It is very necessary that the flask be hot while packing with pink rubber. If this is neglected, little spaces will be left; and the red rubber used to pack the rest of the case, being so much softer than the pink, will find its way into these spaces and crop through on the outside, and make a blemish on the work. When the case has been packed as described, the the larger pieces of pink rubber are placed on the above, and packed above the teeth so as to form the gum above the teeth. This should be well packed against that previously used in small pieces, so as to leave no possible aperture through which the softer red rubber may creep. This being done with all care, the rest of the case is filled with red rubber as will be indicated by the case in hand. The flask is then closed in the flask-press as before described, *and tightened gradually*.

A very convenient thing to have in one's laboratory is a pad for handling hot flasks. It consists of two or three old towels put to-

gether one on another so as to make a thickness of about a half or three-quarters of an inch, with a size of about ten inches square. This is tufted, so as to hold the old towels together, when the whole is covered with some kind of stout twill or bed tick. On one end a loop of tape may be sewed to hang it up by.

Before concluding our instructions on Vulcanite Work we will refer to cases that are frequently met with. We refer to cases where there is a considerable fullness or protrusion of the upper gum, which prevents the employment of either gum section blocks, or of plain teeth with pink rubber gums.

If either of these styles of work is used, the lips, already puffed from the fullness of the gum, will very evidently be more so, if any substance is laid over it, which would give the patient a very unnatural expression about the lips. But while this fullness exists in the front of the mouth, it is frequently found that the gums on each side, in the region between the second bicuspid to the last molar, have fallen away, so as to make the cheeks fall in and require to be filled out. The way to combat cases of this kind will be as follows: Plain teeth are used for all the case. The six or eight front teeth are ground to fit up against the natural gum of the model. The bicuspid and two molars may overhang the ridge slightly. A base plate for such a case should not extend over the alveolar ridge, either at the sides or in front, but should just come up to the ridge. To make a close joint between the teeth and the natural gums, the model may be carved out slightly where each tooth sets up against the gum. The yielding of the natural gum will accommodate itself for this carving on the model. It is best in such cases that the teeth be held down firmly against the model when flasking. This would be impracticable if the teeth were permitted to come away in the upper part of the flask. In order to combat this, we proceed as follows: The teeth being all ground and fitted to the model and articulated, they are attached to the base plate from their *palatal aspects only*, permitting *no wax at all* to come forward on the buccal or labial surfaces. The base plate and teeth attached to it are now removed from the model. The model is dried and when cooled, the teeth and base plate, which were removed in order to dry the model, are replaced and the model painted on each side, with a solution of rubber in chloroform, from the neighborhood of the first bicuspid to the heel of the plate. Pink rubber is now cut in small pieces, softened on a hot brick, and applied to this space by means of a warmed wax spatula heated in the blaze of a spirit lamp. These parts (on each side) are built out at the necessary fullness. The wax base plate, over the palate surface, is smoothed and the case is then flasked.

When separated, the wax is removed and this part of the case packed with red or black rubber (as preferred) as has already been described. It will be found that in packing the pink rubber on each side, as directed, it will fail sometimes to lie close to the teeth and no amount of coaxing will avail to bring it close up. It will be no error to fill such minute spaces, or any rough uneven places with a little wax; for when pressure is exerted to close the flask, the wax will melt and the rubber will fill all inequalities in the process of vulcanizing. In using the wax spatula to pack the pink rubber, care must be scrupulously observed that the spatula be *entirely free from all trace of wax or grease*. If any wax adhere to the spatula, it will get on the pink rubber and it cannot be made to adhere to the rubber solution with which the model was painted at the sides. Fig. 43 will illustrate what has been described.

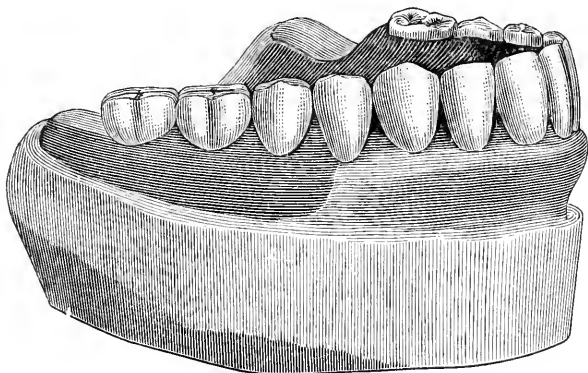


Fig. 43.

It represents a model of such a case. The six front teeth are ground to fit against the model, while the side teeth are packed as shown with pink rubber, before flasking.

There is still another class of cases where other means are to be employed. Such cases are what are termed "long bite." They are cases where the lower teeth impinge so close to the upper gum, that either a metal plate has to be used, or if not, the teeth are to be backed with gold and a heel or extension soldered to them, and this extension imbedded in the vulcanite. Plain teeth for metal work are ground to fit up against the model in the manner before described. This being done, four holes are counter-sunk on the model and the space varnished with shellac varnish. This being dried, it is oiled and plaster of paris, mixed with water to a thick paste, is poured over the faces of the teeth and into the counter-sunk holes. When this has hardened, it is divided at the center, and each half lifted off. The wax used to hold the teeth in position while grinding is then removed. The teeth are backed and the extensions bent and fitted. The extensions are then gummed to the backings with adhesive wax, removed from the plaster matrix, inserted and soldered. This being done, they are boiled in pickle (sulphuric acid

and water) to remove the melted borax, filed up, replaced in the matrix, waxed up, flaked, packed and vulcanized. It is needless to say that only gold can be used for these backings and extensions, platinum being too soft. Fig. 44 will illustrate what has been described.

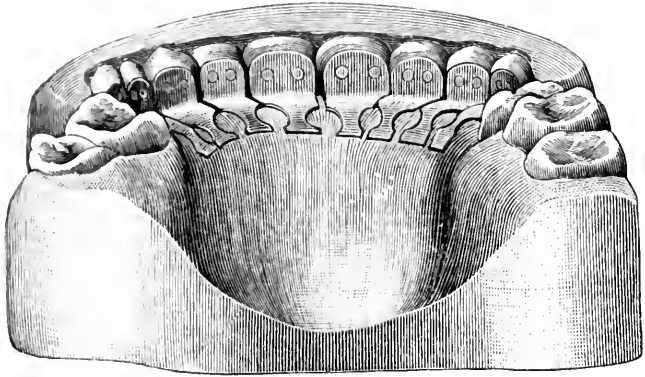


Fig. 44.

In making use of pink rubber to imitate the gums, it is found to be quite laborious to polish this where it runs down in points between the teeth. Much of this labor may be saved by burnishing thick tin foil (No. 60) over the wax before the case is flaked. This must be done very neatly and smoothly, letting the foil run up nearly to the top of the wax and then bending it out at right angles just above the rim so that the investment in the lower part of the flask will not touch it. The upper ring of the flask is now set in place (after the parts have been varnished with shellac varnish, and oiled) and the plaster of investment poured in. When the investment is hard, the wax is softened by placing the flask in warm water. It is separated and all adhering wax washed out with a stream of boiling water. (Not picked away.) The case is then packed with pink rubber as has been described. The following cut will explain what has been described above.

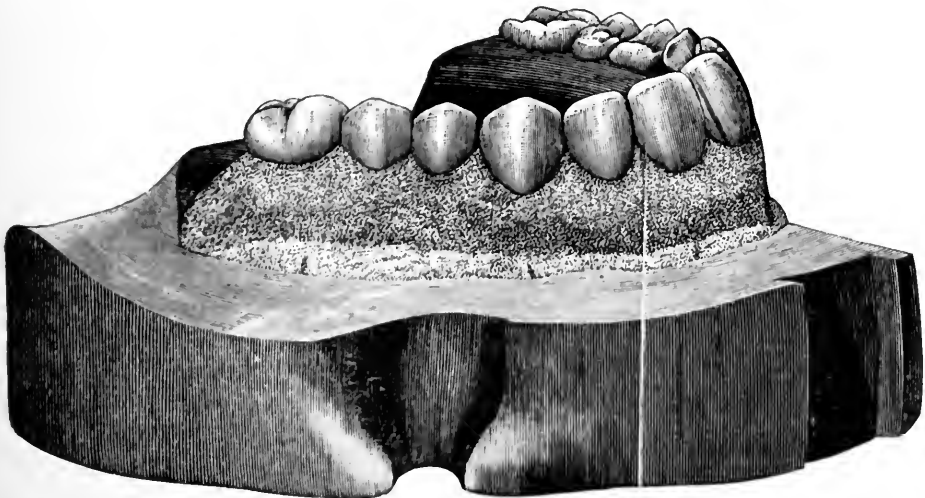


Fig. 45.

We conclude this article on Vulcanite Work by giving a case for lower dentures. These, when entire, are frequently weighted, or weighted rubber is used in their construction. A more artistic and nicer case can be made by making a cast plate of Weston's, Reese's or Kingsley's metal and on this vulcanizing the teeth. For this purpose a wax plate is formed on the model as shown in Fig. 46.

When this is done it is invested in a flask for this style of work and a plate of this kind cast. This being done, articulating wax is placed on it and the bite taken in the manner already described. The case is then placed in the articulator and proceeded with in the same way as described at page 57, Vol. I., No. 3, of this Series. The small pieces seen on the plate in the illustration are for the purpose of securing the rubber to the plate more firmly. Plain or gum section teeth may be used on this metal plate and when these are waxed up they are flaked, packed and vulcanized as before described.

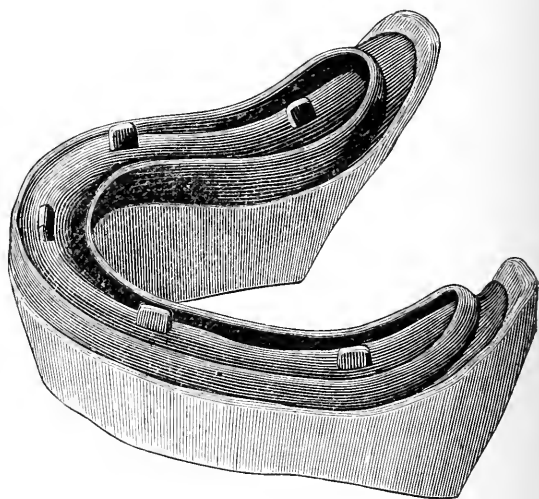


Fig 46.

Plain or gum section teeth may be used on this metal plate and when these are waxed up they are flaked, packed and vulcanized as before described.

POINTS.

It may be well before concluding this article to give some points in the construction of artificial teeth.

1.—The best and most reliable material for taking impressions of the mouth both for partial and entire cases is *plaster of paris*.

2.—The impression should be taken with the plaster made into a paste of medium consistence, not too thin.

3.—Plain teeth with pink rubber to imitate the gums are preferable to gum sections, as better articulations can be secured, and more natural and artistic work can be made.

4.—In partial lower cases where the six front teeth remain, with one or two bicuspid on either the right or left side are the most troublesome cases. The bicuspid should be extracted before the case is undertaken or it will result unsatisfactorily to both the patient and operator.

5.—The hard places in the mouth should be raised or lifted on the model by the use of thick tin foil as described in these papers.

6.—The flask in the vulcanizer should not be covered with water but the rubber should be hardened in steam as has been advised.

7.—In making an entire upper, where the natural lower teeth remain, or an entire upper and lower set, *the six front teeth should not touch each other*. The pressure should be on the two bicuspid and first molar on each side, the last molars on both the upper and lower sets should just barely touch.

8.—Looking at the artificial teeth from the front of the mouth, the *bicuspid*s should be hidden behind the *cuspid*s, and these teeth, as well as the molars, should incline towards the inside of the mouth; both the upper and lower incline towards the tongue. By inclining the back teeth in this way the upper set is less apt to fall while eating, and the lower teeth are held better in place, as the pressure is exerted in such a way as to keep the upper teeth in place.

9.—It is preferable, in constructing entire sets for both jaws, to mount the lower set first, letting the teeth rest over the ridge and after these are mounted in wax, to mount and antagonize the upper set.

10.—In making a lower plate, be sure not to have it too wide. Pull the cheeks and lips of the patient, and observe while doing this if the plate is displaced; if displaced the plate is too wide. The patient also should be told to raise the tongue to the roof of the mouth. If on doing this the plate is lifted or moved it should be cut narrower on the inside. A mechanical dentist speaking on this subject observed:

“On making a lower plate, cut it until you think you have spoiled it, then cut it a little more.”

11.—There is such a diversity of opinion about the “central air chamber,” whether it should be used or not, that we prefer not to advise on this point. Most patients, however, prefer to have the strong adhesion which a central air chamber gives rather than the adhesion which a plain plate gives when the plate is merely lifted from the roof of the mouth.

12.—In selecting teeth as to shade we have found it best always to err on a darker than a lighter color.

13.—Dr. Haskell advises on inserting an upper plate to dip it in water and to place it over the gum with an up and down motion like a pumping, when, if bubbles of air are seen to issue between the gum and edge of the plate the inference is that the plate fits. He says also to test the fit by using the point of an excavator at different points on the plate, and if this fails to dislodge it from the gum, it is presumed that the plate fits and will not fall in eating if the articulation of the lower teeth is correct.

THE PRACTICAL PLACE.

TO ANNEAL STEEL.—According to the *English Mechanic*, a very good way to anneal a small piece of tool steel is to heat it up in a forge as slowly as possible, and then take two fire-boards and lay the hot steel between them and screw them up in a vise. As the steel is hot, it sinks into the pieces of wood, and is firmly imbedded in an almost air-tight charcoal bed, and, when taken out cold, will be found to be nice and soft. To repeat this will make it as soft as could be wished.

GOLD SOLDER.—Dr. McKellops recommends that 89 parts of the plate used (be its carat what it may) be alloyed with 7 parts of silver and 4 parts of copper. This will always prove reliable, flow easily, and most nearly preserve the color of the plate. Should it be necessary to solder *over* this solder, reduce it further in the same proportions, *i. e.*, using the solder itself as the gold to be reduced.—*Dental Register*.

A **VULCANIZING** process, by which rubber is said to be made as hard, smooth and white as celluloid without the use of camphor, has been patented by a Long Island City inventor, who has leased buildings for a factory.

If the above be attainable, it would appear to us that the much to be desired production of a rubber of a gum color, nearer than has yet been made, would be quite a valuable process for the dentist.—*Ed.*

PARTIAL IMPRESSIONS should be well flooded with water just before the plaster is poured. The plaster should be mixed considerably thicker than usual, as the water left in the impression will mix with it and render it thinner. After the impressions of the teeth are filled, pieces of wire may be dropped into them to strengthen them. A cast from a well-drenched impression will show but few, if any, air bubbles, as the water leads the plaster over the surfaces and into the depressions.—*Dental Advertiser*.

IF A COIL OF SHEET ZINC is put into the water in a vulcanizer, it will prevent the formation of much of the black oxide which is found on iron flasks and clamps. After the zinc has been used three or four

times the flasks will soil the fingers but very little when handled.—*Dental Advertiser*.

VERATRINE AS AN OBTUNDENT OF SENSITIVE DENTINE.—Dr. Bogue (New York) recommends a certain amount—about a grain—of veratrina, which will dissolve in about three drops of alcohol. To that put sufficient tannin to saturate it, and then add ten drops of glycerine. It will of course be understood that this remedy must be applied when the dam is in place and the teeth perfectly dry, as it is exceedingly poisonous. One-fiftieth of a grain is a dose. After being in the tooth ten minutes I wash the cavity with alcohol, dry it thoroughly, and find I am able to excavate with little pain.

GOLD AND SILVER SOLDERS.—The process of formulating and compounding an alloy with which to form gold and silver solders, develops what seems to be a fact, that pure zinc—i.e., free from arsenic, antimony, cadmium, etc.,—will not render gold brittle. Take of chemically pure metals, silver, one part; zinc, two parts; copper, three parts. Melt the copper in a clean borax-lined crucible, add the silver, then the zinc in small portions, with constant stirring with a clay rod. When the denser fumes of the burning zinc pass off, pour from a height into water, or pour into an ingot mold. The resulting “solder alloy” may be used in the place of the metals usually employed in connection with gold and silver for gold and silver solders, with the following results: The solder will follow and retain the color of the plate used, and will be tough and free from brittleness. The usual method of employing this alloy is to take from four down to two parts of either gold or silver (as gold or silver solder is desired) to one of the alloy, melting together under borax with agitation, rolling to the desired thickness, and marking on one end the carat of the gold used (if gold) and also the proportion of gold, as for instance 20 (20 carat gold), 3 (3 parts gold). The solder formed by the use of this alloy is easily made, easy flowing, and as strong as the plate from which it was made.

SIMPLE TEST FOR GOLD.—Take a piece of flint and rub against it the metallic object to be tested, until the latter leaves a sufficiently marked trace upon the stone. Upon bringing the flame of a sulphur match in contact with the spot, the latter will remain intact if it has been made with gold, but will disappear if the contrary be the case.—*La Science en Famille*.

AN EXCELLENT PICKLE for gold work may be prepared from the following formula: Oxalic acid, $\frac{1}{2}$ oz.; sulphuric acid, 1 oz.; water 6 oz.—*Ind. Pracr.*

ALUMINUM SOLDER.—Twenty parts of aluminum, 80 parts zinc. Melt the aluminum, then add the zinc with a little fat; stir this with an iron rod and pour in molds. Another formula is aluminum 90 parts, tin 10 parts.

NEW LOCAL ANÆSTHETIC.—A crystalline substance has been obtained in minute quantities from the rind of pomegranates, which when placed on the tongue or other portions of the mucous membrane paralyzes local sensation after the manner of cocaine.—*Pacific Record*.

TO HARDEN PLASTER.—Dr. Wingate advocates dissolving a little sugar in the water before mixing plaster, claiming that the cast will be much harder. Also the placing of a small piece of sheet zinc in the vulcanizer to prevent the formation of the black coating found on iron flasks and clamps.

AMALGAM FINISHER.—In many places a narrow strip of rubber dam, used as a tape, will serve admirably for the purpose of smoothing down to the borders and polishing amalgam fillings on proximal surfaces of the bicuspid and molars, and is especially good for removing any particles that may adhere to the gum between the teeth.

ROOT CANAL DRYER.—One of the latest and best inventions for use in dentistry has recently been gotten out by Dr. J. H. Woolley, of Chicago. It is a root canal dryer, and consists of a handle, similar to that of a plugger. To the end of this is screwed a cone of copper to which a copper broach of any size can be attached. The cone is heated in the flame until quite hot, then the instrument is ready for use; the heat being steadily conducted from the cone to the end of the broach. With it a root can be thoroughly dried to its apex. The instrument acts also as a disinfectant, destroying, as it does by heat, any microbes within the cavity. It has been highly indorsed by prominent dentists.

WATT'S METAL makes an excellent die for striking up gold-crowns by Dr. Melotte's method, using the Melotte metal for the counter.

PUMICE CARRIER.—Dr. G. B. Clement says, take any shape wood point and, when inserted and revolving in the engine, wrap it tight with a piece of absorbent cotton. This dampened makes a splendid carrier of pumice stone or powders.—*Southern Journal*.

WASHING OUT THE STOMACH.—This operation, such a novelty a few years ago, is coming quite in vogue. A Maryland doctor

employs the method very extensively in cases of dyspepsia. The following is the *modus operandi*: A soft red rubber tube is passed gently down into the stomach, quite to the pylorus; with this is connected about a yard of common flexible tubing and a glass funnel, which is held on a level with the patient's breast, and tepid water is poured slowly into the funnel until a sensation of fullness is experienced. The funnel is then depressed to the level of the waist, and the fluid allowed to siphon out. The process is repeated until the water returns quite clear.

AN ETHERIAL SOLUTION of Tannin, of syrup consistence, is said to be the best application to burns. It immediately soothes the intense pain, dries rapidly and forms a pliable, non-elastic coating which is preferable to collodion, because it does not shrink and become stiff.

FACTS ABOUT THE HUMAN BODY.—The skin contains more than two million openings, which are the outlets of an equal number of sweat glands.

The human skeleton consists of more than two hundred distinct bones.

An amount of blood equal to the whole quantity in the body passes through the heart every minute.

The full capacity of the lungs is about three hundred and twenty cubic inches.

About two thirds of a pint of air is inhaled and exhaled at each breath in ordinary respiration.

The stomach daily produces nine pounds of gastric juice for the digestion of food; its capacity is about five pints.

There are more than five hundred separate muscles in the body, with an equal number of nerves and blood vessels.

The weight of the heart is from eight to twelve ounces. It beats one hundred thousand times in twenty-four hours.

Each perspiratory duct is one-fourth of an inch in length, which will make the aggregate length of the whole about nine miles.

The average man takes five and one-half pounds of food and drink each day, which amounts to one ton of solid and liquid nourishment annually.

A man breathes eighteen times a minute, and three thousand cubic feet, or about three hundred and seventy-five hogsheads of air an hour.

PHYSICIANS' BILLS.—Miss Wolfe, owner of \$10,000,000, who lately died paid Dr. William Todd Helmuth \$5,000 a year to doctor her. Mrs. Alex-

ander T. Stewart retained three doctors at an aggregate cost of at least \$40,000, and called in one of them nearly every day. Mrs. William Astor pays to Dr. Fordyce Barker annually an average of \$20,000, always sending a check for double or treble the amount of each bill rendered. Her idea is that by rewarding his skill and vigilance liberally she will get the very best service of which he is capable. Mrs. Cornelius Vanderbilt's physician is Dr. W. S. Belden, and although her health is excellent he is consulted often, prevention being preferable to cure, doubtless, and the belief is that the prevention costs not less than \$10,000 annually. [And yet the large majority of patients complain of extortionate dental bills.—*Ed.*]

A NEW SOURCE OF INDIA RUBBER.—According to the *Bulletin de la Societe Chimique de Paris*, the *Sonchus oleaceus*, a plant which grows wild in France in dry places, along roads and among rubbish, has been found to contain india rubber. This is extracted by treating the plant with bisulphide of carbon, and boiling the extracted substances with alcohol. The mass is then heated with alcoholic potash, and washed several times with warm diluted alcohol. This removes all greasy and waxy matter, as well as chlorophyll. The residue is elastic, and presents all the characteristics of indiarubber. It dissolves entirely in bisulphide of carbon and in chloroform, and partly in ether.

VINEGAR AND DIGESTION.—According to *Good Health*, experiments have shown that even so small a quantity of vinegar as one part in 5,000 appreciably diminishes the action of saliva upon starch. One part in 1,000 renders it very slow, and twice the latter quantity arrests it altogether. From this it is evident, says our contemporary, that vinegar, pickles, salads and other preparations in which vinegar is used are unwholesome, especially when taken with farinaceous food, such as bread and other grain preparations.

EFFECTS OF BITTER EXTRACTS ON DIGESTION.—Dr. Cheltoff (*Lancet*) has been making experiments with a view of determining the true action of bitter extracts upon digestion. The drugs tested were the ordinary bitters—quassia, cascarilla, columbo, gentian, etc., and the deductions were briefly as follows: Bitter extracts, even in moderate doses, interfere with gastric digestion. In large doses they diminish the secretion of gastric juice; small doses may cause a temporary increase, but they diminish its digestive power. Bitter extracts do not affect the pancreatic secretion, but they do re-

tard the further process of digestion which proceeds below the pyloric orifice. They affect the flow of bile either not at all or only slightly. They impair the assimilation of nitrogenous food.

BORIC ACID AS A LOCAL ANÆSTHETIC.—Dr. A. C. Ewing reports in the *Am. Practitioner* a case in which boric acid was found to exert decided anæsthetic properties when used as a local application. The patient was suffering from a deep suppurating wound in the palm of his left hand. Thirty grains of boric acid was dissolved in a half-ounce of water and a pad of absorbent lint was saturated with the solution and applied to the wound. When the patient reported next day, the doctor was “agreeably surprised to find that he had not suffered in the least during the night.” The same dressing was continued, and the wound healed rapidly by granulation.

THE PHYSICAL PROPERTIES OF VULCANITE.

BY GEORGE B. SNOW, D. D. S., BUFFALO, N. Y.

India-rubber, when vulcanized, undergoes very considerable changes in its mass, as follows :

It expands with great force, and at a rate over six times greater than that of iron, when subjected to heat.

When hardening, it contracts; increasing in specific gravity, and showing its contraction by a change in shape of its mass : flat sides becoming concave, and convex sides being distorted and flattened ; the action being most evident in its thicker portions.

After it is vulcanized, it undergoes contraction by cooling to a greater extent than most other bodies.

The extent and force of the expansion of rubber, when subjected to heat, render it imperative that when it is packed in a mold and vulcanized, as when a dental plate is formed, a full and free escape should be provided for surplus rubber, and for its increase in bulk by expansion. This is usually done by cutting grooves or gateways extending from *the mold* (which term will be here used to denote the cavity which is packed with rubber to form the plate) across the parting-face to the edge of the flask. (The term “parting-face” is applied

to the opposing surfaces of plaster outside the "mold," which come in contact when the flask is closed.)

A reference to the engravings used as illustrations in books giving instructions for making vulcanite plates, will show this parting-face scored with radiating grooves, with possibly one circumferential one, dividing the space between the mold and the flask; thus leaving a considerable portion of the face to come into close contact with its counterpart. When the fact was taken into consideration, that rubber is excessively viscid, flowing only slowly and with considerable difficulty, and that when it once finds lodgment between two surfaces it is impossible to expel it wholly by any reasonable amount of pressure, it will be evident that the remaining surface of the parting-joint will form a serious obstacle to the complete closure of the flask. Inspection of a plate as it is removed from the flask after vulcanizing, will usually show it surrounded by a "fin" of rubber, and the articulation of the plate will be faulty by the amount of thickness of this "fin," which can only be present, under the usual circumstances, when the flask was incompletely closed.

The whole surface of the parting-face should be removed, except, possibly, a narrow margin, not over one-eighth of an inch in width, next the mold, by a cut extending entirely around the mold and gradually increasing in depth towards the flask. The escaping rubber will then be entirely free as soon as it passes the margin; and if this is scored at intervals, so that the rubber may still find vent, as it expands by heat, the flask may be closed more perfectly and a closer articulation secured than if a large portion of the parting-joint is left intact. It may, indeed, be well to also remove a little from the surface of the margin; enough to allow for the "fin" of rubber, which will always be found if there has been any escape from the mold, and which, thin as it is, denotes a slight disturbance of the articulation of the plate. Very little thought is usually given to the matter of cutting gateways; but if they are insufficient, or if so much rubber is used as to fill them, its force of expansion will inject the joints with it, darkening them, and will sometime crack section teeth or force them out of place.

Much damage is done by haste and the exercise of undue force in closing the flask. Sufficient time should be taken to allow the rubber to accommodate itself to, and to move before, the pressure applied to it. The few extra minutes required to do the work easily will be time well spent.

The following points should always be attended to in making vulcanite plates, to insure good results :

1.—If section teeth are used, let them be thoroughly cleansed of wax. See that the rim of the plate does not overhang the edge of the gum at any point. If there should be a coating of wax upon the surface of the teeth, the plaster investment could not be brought into close contact so as to support the section properly, and it may be cracked by the pressure used in closing the mold. If the rim overhangs the gum, it may be broken by contraction of the rubber in cooling, as will be explained further on.

2.—In fitting the joints, they should be so ground that the surfaces of contact will bear squarely upon each other. If the bearing is only at the front edges of the joints, the contraction of the rubber in cooling will draw the sections together with such force as to oftentimes chip off little pieces of the face of the gum, forming a serious disfigurement. To prevent dark joints, fit them as closely as possible, always keeping the ground surfaces absolutely clean, and making a slight bevel on their inner edges. Before waxing up, cover the outer edges of the joints with oxy-phosphate of zinc. This is to be applied not *in* the joints, but to the gum surface—the section being in place—to prevent dirt working into the joints from the outside. The oxy-phosphate may be colored, to imitate the gum-color, with a red pigment, preferably with iron as a basis, *e. g.*: Jeweler's rouge, or Indian red. Red lead, for instance, would blacken from chemical action in vulcanizing.

3.—After the flask is filled, let it stand before proceeding to pack it, until the plaster is thoroughly hard; waiting, if possible, some hours. It may be opened and made ready in the meantime, but pressure should not be brought upon the plaster until it is abundantly able to bear it without yielding.

4.—Warm the flask, before attempting to open it, by immersing it for a few minutes in *warm*, not hot, water. Remove the base-plate, and rinse the mold thoroughly with a stream of *boiling hot* water.

5.—Twist a very few fibers of cotton wool into a thread, and pack the beveled openings at the inside of each joint, fastening each end of the cotton into the plaster above and below with an excavator, and carrying the cotton well into the grooves; using not enough to entirely fill them. The mistake is often made of using too large a thread. Instead of packing the joints with cotton, as above described, they may be cemented with oxy-phosphate of zinc, colored to imitate the gum.

6.—With a scraper, cut away *all* the parting-face entirely around the mold on one part of the flask, preferably the lower or mold side, leaving only a narrow rim next the mold, and scraping this slightly

Let the cut deepen gradually, so that it will be nearly one-eighth of an inch in depth next the edge of the flask. Cut notches at least one-sixteenth of an inch deep at intervals half an inch apart into the cut just made, leading into the mold.

7.—Paint the plaster surfaces of the mold (both palatal and lingual sides) with a *thin* coating of Liquid Silex, wiping off any surplus with a pledget of cotton. Do not allow any of the silex to touch the teeth or pins, and let the coating dry before packing the mold. It is usual to coat the model, either as above described, or with tin foil. It will be found advantageous to apply the silex to the lingual surface as well, as the unprotected plaster unites with the rubber, and—especially if black rubber is used—the result is a hard, white crust, covering the plate, which is very destructive to the edge of the scraper. If the silex is applied, the plate leaves the mold with a clean surface, easily finished.

8.—Ascertain the exact quantity of rubber necessary to fill the mold. Guess-work is bad practice. If the base-plate is made of wax, weigh it, and use four or five grains more than twice its weight of rubber. If the ordinary balance is used, the wax can be added to the weights, after weighing it, to give the weight of rubber required, using as surplus, a piece as large as the finger-nail. If the base-plate is made of other material than wax, its bulk can be ascertained by displacement, the Woodard Rubber Gauge being a very convenient instrument for the purpose. An approximation can be made by throwing the base-plate into a tumbler of water, noting the height of the water exactly, removing the base-plate and dropping in slips of rubber until the water stands at exactly the same point as before. If there are very thick places in the plate, pieces of old vulcanized rubber may be put in with the rubber gum, when its weight or bulk is ascertained, and these pieces used in conjunction with the vulcanized gum, to pack the thick parts. They should first be tried and fitted to the places they are to occupy, and should be *freshly filed* all over, and be thoroughly clean.

9.—The rubber should now be warmed enough to soften it, by putting it on a warm dish, and the mold carefully packed; putting in the rubber so that it will be moved as little as possible when the flask is closed. Place the two parts of the flask together and insert the bolts, screwing them up lightly. The flask must now be heated to insure plasticity of the rubber. This is best done by boiling it in water. When it is hot, screw down the bolts slowly and evenly, passing from one to the other. Take plenty of time and use as little force as possible. When the flask is closed, it is ready for the vulcanizer.—*Dental Advertiser*.

MAKING DIES WITHOUT MOULDING IN SAND.

The following extracts from an article, by Dr. F. Y. Clark, on a "New Method of Making Dies," in Vol. I. of *Dental Cosmos*, will be of special interest at this time, because metal plate-work is becoming more popular every day among the best operators. The article is unusually valuable in making metal dies for bridge work.

Without referring to the advantages enumerated by Dr. Clark, we give the article from the point where he indicates the process.—*Ed.*

"To commence, it is necessary to have an impression cup made from brass, German silver, copper or any other metal that will stand the necessary amount of heat for obtaining a metallic die without change; we prefer one made from copper, because this metal is more malleable and easily cleansed after using, than any other that we have tried. It should differ in no other respect from the ones in general use, except in the perforation of holes all over its surface, about one-fourth of an inch apart and one-eighth of an inch in diameter. These holes are very essential, for they not only prevent the material from leaving the cup in removing it from the mouth, but greatly facilitate the escape of moisture in drying, or on receiving the metal for the die. With a cup as described we use a batter composed of equal parts of clear white spar, and the best calcined plaster of Paris. The manner of taking an impression with this batter is nearly the same as with plaster alone. It should be mixed somewhat thicker at first than plaster batter used for the same purpose, and kept in constant motion until there are unmistakable signs of its setting, and then conveyed to the mouth as quickly as possible. We think only a little experience is all that is necessary to convince anyone that there are few cases, if any, where a better impression cannot be taken with this mixture than with either plaster or wax. The impression when taken should be placed in a flask, three-fourths of an inch deep, made from gray iron with a large open space in the bottom, leaving only a rim on the inside large enough for the impression cup to rest upon. This open space is for the escape of moisture coming from the holes in the cup as before described. The space between the impression and the flask should now be seamed up with a batter a little thicker than that used for the impression; it should be spread so as to prevent running down between the cup and the rim of the flask: use just enough batter to hold the cup in place and give a smooth contin-

uous surface to the parts. The flask and impression thus prepared are now ready for the second flask about two and one-half inches deep which is placed around the first. The whole should now be placed in an oven or on a stove, or any place where it will dry; this can be done either rapidly or gradually; when we are in a hurry we generally have it dry by the time the metal is melted, but it may be better to give it more time. It is not my wish to say anything here about metal; almost every dentist has some peculiar favorite of his own; of course it is immaterial what kind is used in this process. After the metal is poured and when the die has become sufficiently cold it should be next removed from the impression, and flask No. 2 placed around it as before, then inverted, and the counter cast taken.

"In conclusion, we would remark that the time and labor necessary to obtain a die by this process, will on fair trial be found about one-third of that consumed by the usual method, besides having a more perfect cast."

THE HERBST METHOD OF FILLING TEETH.

BY C. F. W. BÖEDECKER, D.D.S.

Dr. Bœdecker proposes in this paper to describe the recent improvements in Herbst's system. He points out that the advantages of that system are:—

1st.—Better adaptation for the walls of a cavity than any other system renders possible.

2nd.—The saving of time.

3rd.—Increased facility in some of the most difficult operations (as proximate surfaces of the molars and bicuspid).

4th.—Gold can be perfectly adapted to the thin walls of enamel without danger of fracture.

5th.—The introduction of gold, when done by this method, is much less annoying to the patient, and less laborious to the operator.

The instruments used for this method have been very much modified; they are mostly ordinary smooth burnishers, of which there are three sets: one set of engine points (Herbst), one of hand instruments (Herbst), and one of bent hand instruments (Abbott). Of the old tse

of steel engine instruments, only a few are now employed, although sometimes all can be used. The most important of them is the roof-shaped instrument, of which there should be several sizes. These can easily be made out of a broken bur, as follows: The broken instrument is put in the hand-piece of the engine, which, while rotating rapidly, is ground upon an Arkansas stone, or sandpaper. The instrument should lie obliquely on the stone or sandpaper, like a pen in writing, and be quickly moved, drawing it from one side to the other.

The larger instruments are mostly intended for the use of amalgam and tin. The pointed instruments are used for finishing and condensing the edges of proximate fillings. Dr. Bœdecker adds to these three very small, round points, in shape resembling a round cavity bur. They are designed for the use of small proximate cavities in incisors.

Agate, blood-stone, or garnet rotating instruments are better than those made of steel. Gold does not cohere upon them. The surface of a gold filling, which has been condensed by means of an agate or garnet instrument, is very much harder than a filling which has been inserted by steel-points. But a great drawback in the use of stone instruments is their liability to fracture. Herbst exhibited some agate points which had been set in such a manner that only about one thirty-second of an inch of the stone protruded from the steel mandrel, and they would withstand considerable pressure before breaking. These stone points are intended to be used for direct pressure, but for larger surfaces. Herbst has of late employed round agate or garnet beads fastened upon a mandrel with sulphur, and these are intended to be used for lateral pressure, especially in finishing, grinding or labial surfaces. Stone points should not be polished, but roughened upon a corundum stone, while rotating in the engine.

To secure a better union between the different layers of gold when stone instruments have been employed for condensing, the surface of the gold should be roughened by means of a serrated hand plugger, for which purpose Herbst employs a freshly broken excavator.

Dr. Abbott's set is composed of bent burnishers, for places inaccessible to a straight instrument.

In the Herbst method, all complicated cavities (*e.g.*, proximate ones) possessing one, two or three lateral walls, are converted into simple ones (such as cavities involving the grinding surfaces of molars, and having four lateral walls); this is done by using a proper matrix. The matrices are made of steel, German silver, wood or shellac, or the Jack matrices may be employed. For the proximate surfaces of molars and bicuspid, the German silver band matrix should be used. The German silver band matrix can be made as follows: A piece of

this metal, No. 32, about one inch in length and as wide as necessary, is bent around the tooth to be filled, so that the metal ends come to the tooth's buccal surface. It is then compressed around the tooth by a pair of specially made pliers. The ring is withdrawn, a little soldering fluid applied united by tin solder. If the tooth to be filled stands alone, the German silver matrix must be strengthened, either by soldering a thin brass wire around it, or by flowing tin solder upon the outside of the matrix wherever strength is required. In soldering, no tin must be allowed to run to the inside of the matrix, especially that part which faces the cavity to be filled, or the tin will touch the rotating instrument, and be incorporated into the filling and impair the cohesion of the separate layers of gold. The matrix must be thoroughly cleansed after soldering, which can best be done with the dental engine, by means of a piece of cotton wound around an old engine bur dipped in moistened pumice. The watch-spring matrices are made out of a piece of watch-spring saw, as follows : A piece of saw half an inch long, as broad as the cavity is deep, is cut off and heated over a spirit flame until it is dark blue. The points of the matrix which are to rest on the cervical edge of the cavity are well rounded off, that in cavities extending under the gum it may be pushed down without injuring either the lingual or buccal portion of the gum. The lateral ends of the matrix must be bent like a clasp around the lingual and buccal portion of the tooth to be filled. When thus prepared, it may be secured by one or two wedges of wood, or ordinary pins, inserted, one from the buccal the other from the lingual side. These wedges should be placed near the gum, between the matrix and the adjoining tooth, firmly pressing the former against the edges of the cavity. In adjusting a matrix in all mesial cavities it must not quite reach the grinding surface of the tooth, or it will obstruct the entrance to the cavity. All the steel matrices may be saved and used again. When two cavities in bicuspid, or molars, face each other, if this plan fails, the matrix, being placed in position, may be secured by filling one of the cavities with cotton or shellac.

For filling in the proximate cavities, when opened from either the labial, the buccal, or the lingual side, a piece of thin steel spring about four to six inches long, and one-eighth to one-fourth of an inch wide may be used, as a matrix. Across one end of this spring a piece of German silver or brass tubing tin is soldered, so that when the spring is in position between the teeth to be filled, the tubing prevents it from being pulled through. In other instances, one end of the steel spring may be fastened into a small piece of shellac, and while this is yet soft and whole may be pressed into the desired position.

This form of matrix is especially applicable for teeth with large crowns and narrow necks, such as lower bicuspid, when the steel spring without the shellac would impinge upon the gum. This steel spring may also be used as a protection to a neighboring tooth during the preparation of the cavity.

In some instances, where the lingual walls of upper incisors to be filled from the labial surface, are not broken away, a piece of German silver, about one inch in length, and wide enough to wholly cover the cavity in the lingual surface of the tooth to be filled, may be used as a matrix. Insert it between the proximate surfaces of the incisors containing the cavity, and bend one end of it so as to cover the cavity in the lingual surface; the other end is bent out of the way, over the labial surface of the adjoining tooth.

If a cavity from the lingual surface of an incisor tooth is to be filled, the matrix must be reversed.

For filling the proximate surfaces of incisors when their lingual walls are much broken, as well as in contour operations a matrix of shellac is employed, made as follows: A piece of shellac, the size of a large walnut, is warmed over a spirit lamp to the consistency of putty, and after applying the rubber dam, this is pressed against the lingual wall, extending a little over the cutting edges of four or six of the teeth. When hard, it is again removed from the mouth, cooled in water, and a small piece of steel spring warmed over the flame of a lamp is inserted in the shellac at the place corresponding to the proximate surfaces of the tooth or teeth to be filled, and, while yet warm, the matrix is replaced in the mouth, and adjusted as required. The piece of steel spring must not quite reach the labial surface of the tooth, or it would obstruct the entrance of the cavity during the introduction of the gold.

The matrices used for contour operations of incisors are made in the same way; but besides the steel matrix of the proximate surfaces, an additional one should be inserted corresponding to the cutting edge of the tooth to be restored.

During the introduction of the filling material, the gold, which (when unannealed) apparently shows no signs of cohesion, working as soft as tin foil, when burnished, becomes somewhat cohesive.

The gold best adapted for this method of filling is very soft cylinders. If foil is used for the first layers of the operation, Nos. 3, 4, and 5 are the best for the purpose. The leaves are cut into halves, and rolled into a rope between the fingers, and cut into pellets of required length; or the sheet may be divided into squares from one-half to one inch, which are formed into pellets. The foil, as well as the

cylinders, should never be annealed when used in the first layers of the cavity, except it be a contour operation.

In this starting of a filling, the first layer must be sufficiently large, so that when condensed it will lie securely in the cavity without being supported by an instrument. If too little gold has been put into the first layer, or when a number of too small cylinders are used, and an attempt is made to condense them, the gold will roll about under the instrument, and become too hard to be again adapted to the walls and edges of the cavity. In very large and flat cavities with little undercut, the first layer should be condensed by cotton, as follows: For a large cavity, introduce from 5 to 8 large, soft gold cylinders, without condensing them. A piece of chemically pure cotton, as large as the cavity will hold, is then inserted in the cavity, and it is pressed into every part of the cavity by a rotating burnisher. After the cotton is removed, the gold is further condensed into every depression with agate points.

The Herbst hand instruments, while pressing hard upon the gold, are rotated in the hand about one-half or three-quarters of a turn; but the Abbott instruments are merely moved from side to side. By a rotary motion the gold is much better condensed than by simple pressure. Before the hand instruments are used, they should be rubbed upon a piece of No. 1 sandpaper. After the gold has been thus condensed, the perfect adaptation is obtained by a roof-shaped point, made of steel or agate, in the engine. After the instrument is passed over a piece of sandpaper and is perfectly clean, it is, while rotating, pressed firmly upon the gold, condensing it thoroughly into every depression of the cavity. In condensing, this instrument should be moved round, especially along the edges of the cavity. In using steel points, the engine must not run too fast, and the burnisher, while in motion, must not come in contact with the gold longer than from five to ten seconds, lest the gold be heated to such an extent as to cause discomfort, or even great pain to the patient. The first layer of gold being thoroughly condensed with the roof-shaped instruments, the hand instrument, while rotating, is pressed firmly round the edges and depressions of the cavity. If this makes any deep pits in the gold, then in these places it was not perfectly condensed, and a smaller roof-shaped instrument should be used. All deep pits present in the layer of gold should now be filled up with very small gold cylinders, and thoroughly condensed until the surface of the gold is even. If stone instruments have been employed for condensing, the gold should be roughened by a serrated hand plugger (a freshly broken excavator), or a rotating steel point in the engine, before another layer of gold is

added. All the succeeding layers of gold are manipulated in the same manner, except upon larger surfaces, where we can employ the garnet or agate bead with lateral pressure, when heavy foil (Nos. 30 to 60) gives better results. This may be packed upon the other layer of gold in single strips, burnishing every piece down by means of the rotating instrument, while directing the foil by means of a pair of tweezers in the same manner as in packing heavy foil by the electro-magnetic or mechanical mallet. Herbst introduces a rather thick layer of heavy foil first, and then uses the agate or garnet bead; but in these instances, considerable pressure is required to condense the gold perfectly. In some situations, as in buccal walls of molars and bicuspid, when the gold cannot be condensed by direct action of the instrument, the right angle attachment, or an Abbott hand instrument, should be employed.

Tin is used like gold, either as foil or as Robinson's metal. Nos. 4 to 6 foil is cut in half, and made into a rope with the fingers or a napkin, and cut into pieces of the desired length.

Cavities in front teeth, which it is intended to fill with amalgam or oxy-phosphate, may be lined with a thin layer of gold, which will impart to the thin wall of enamel a very life-like appearance. A large and very soft gold cylinder is compressed between the fingers and immersed in a thin solution of gum-copal (about 2 grs. of gum-copal to $\frac{1}{2}$ oz. of sulphuric ether), this prevents the mercury from uniting with the gold, and so discoloring the tooth. The surplus liquid is expressed with the fingers, the ether allowed to evaporate, and then, by means of a piece of cotton, the gold is pressed into the cavity and thoroughly condensed by a rotation instrument in the engine pressed firmly upon the cotton. Upon the removal of the cotton the thin layer of gold is thoroughly and uniformly adapted to every part of the cavity, which may then be filled, either with amalgam or cement, without future discoloration.—*Independent Practitioner.*

SPRINGFIELD, LINN CO., IOWA., 9, 3, 1887.

JOHNSON & LUND,

GENTS :

I have been using your Artificial Teeth for the past twenty years. I find them strong, natural in appearance and possessing all the desired qualities that any one need ask for.

Yours Respectfully,

GUSTAVUS NORTH.

PENNSYLVANIA STATE DENTAL SOCIETY.

The nineteenth annual meeting of the Pennsylvania State Dental Society was held at Glen Summit, Pa., June 26 to 28, 1887. The following officers were elected for the ensuing year: W. F. Fundenberg, president; W. E. Van Arsdell, first vice-president; Louis Jack, second vice-president; Wm. B. Miller, recording secretary; J. R. C. Ward, assistant secretary; P. K. Filbert, corresponding secretary; L. Ashley Faught, treasurer; S. H. Guilford, chairman of executive committee; G. L. Robb, chairman board of censors.

The next annual meeting will be held in Philadelphia, on the first Tuesday in June, 1888.

P. K. FILBERT, *Cor. Sec.*,
Pottsville, Pa.

WISCONSIN STATE DENTAL SOCIETY.

At the annual meeting of the Wisconsin State Dental Society held in Milwaukee, July, 19 to 21, 1887, the following officers were elected: W. F. Lewis, president; C. C. Southwell, first vice-president; F. L. Dolbeare, second vice-president; W. S. Sullivan, secretary; and B. Douglass, treasurer.

W. S. SULLIVAN, *Secretary*,
Madison, Wis.

CENTRAL ILLINOIS DENTAL SOCIETY.

The sixth annual meeting of the Central Illinois Dental Society will be held at Springfield, Ill., October 11 and 12, 1887. A cordial invitation is extended to all to attend this meeting and take part in the discussions.

W. A. JOHNSON, *Secretary*,
Peoria, Ill.

WESTERN DISTRICT DENTAL SOCIETY OF ILLINOIS.

The second annual meeting of the Western District Dental Society of Illinois will convene at Macomb, Ill., on the third Tuesday of October, 1887, and continue two days.

Great preparations are being made for fine clinics, and all dentists are cordially invited to attend.

R. W. BAILEY, D.D.S.,
Macomb, Ill.

Dentists' Pocket Diary and Appointment Book, FOR REGISTERING APPOINTMENTS.

THURSDAY.

188

8		1	
9		2	
10		3	
11		4	
12		5	

FRIDAY.

8		1	
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11		4	
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We show above the precise size and fashion of two-thirds of a page of the Appointment Book. It contains blanks for fifty-four weeks, three days being provided for upon each page, so that when the book is open it presents engagements for one week. The figures denote the hour of the engagement, and being without date, it is good for any time. It also contains a neat memorandum in the back part.

Flexible Cloth Cover, red edge,	\$.65
" Morocco " "75
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FINE

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COHESIVE. EXTRA COHESIVE.

SOFT OR SEMI-COHESIVE.

Each Grade Uniform in Quality. Does not Ball up under the plugger. Its absolute purity is unquestioned.

Nos. 3 to 240.

Works with the utmost smoothness. Exhibits great softness under the burnisher. Possesses a wonderful amount of durability and toughness.

PRICE.			
Per $\frac{1}{8}$ ounce.	-	\$4.00	Per 1 ounce, \$29.00
" $\frac{1}{4}$ "	-	7.75	" 2 " 57.00
" $\frac{1}{2}$ "	-	15.00	

Steurer's Plastic Gold.

We respectfully call attention to a new form of **Dental Gold**, that we have introduced to the profession under the name of "**STEURER'S PLASTIC GOLD.**"

It is a chemically pure Gold in a plastic state, without admixture of any foreign substance, of a brown color and homogeneous appearance.

We claim the following advantages over all other forms of Gold heretofore used:—

- 1st. It is more cohesive.
 - 2nd. It has a spreading quality before it is completely condensed, so that it can be moulded into any cavity.
 - 3rd. A tooth can be filled in one-third of the time it takes with any other Gold, simple hand pressure being sufficient to make a solid filling, the mallet (which is so disagreeable to most patients) can be dispensed with, and so sensitive teeth, or those whose walls are frail, can be easily filled.
-

Beware of worthless imitations. Be careful to see that it is in the shape of small square pieces, packed in bottles, and labeled *Steurer's Plastic Gold*, because the imitations, although they may apparently work tolerably in the commencement, do not make a solid filling, but gradually crumble away.

AS WE HAVE TO PAY CASH FOR THE GOLD AND THE MARGIN
IS SO SMALL, WE MUST SELL FOR CASH ONLY.
PLEASE SEND CASH WITH ORDER.

Price Per Bottle, 1-16 oz., \$2.50. Sent postage free on receipt of price.

JOHNSON & LUND,

DENTAL DEPOTS,

20 Race Street, Philadelphia.

514 Wabash Avenue, Chicago.

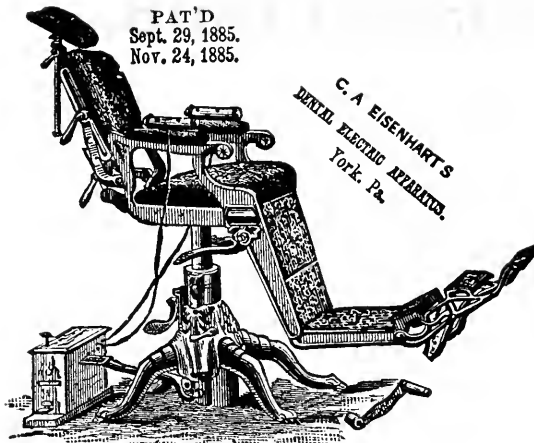
1,000 FINE

EXTRA TOUGH GOLD PELLETS,

Nos. 1-4, 1-2, 3-4, 1, 1 1-2, 2, and assorted.

JOHNSON & LUND,

20 Race St., Philadelphia. 514 Wabash Ave., Chicago:



January, '88. PRICE COMPLETE, \$40.

AN ULTIMATE TRIUMPH

Teeth extracted by Electricity, and sensitive cavities excavated with ease. Best recommendations furnished on application to

Dr. C. A. Eisenhart,
Patentee and Manufacturer,
307 W. MAIN STREET,
YORK, PA.



April, '88.

MERCURY

Chemically Pure.

Try it. You will use no other.

1-4 lb. Bottle, 40 Cents.

Absorbent Cotton.

A SUPERIOR ARTICLE

NONE BETTER.

One Ounce, 12 cts. Two Ounces, 20 cts.

KNOXVILLE DENTAL DEPOT,

No. 11 Asylum Street, Knoxville, Tenn.

Here may be found a Complete Assortment of Dental Supplies. I keep all Dental Goods and Instruments made and Handled by

Johnson & Lund,

M. M. HARRIS, Proprietor.

JAMES M. ERNEST,

MANUFACTURER OF

DENTISTS' FILES

of all descriptions,

No. 2121 Sargeant Street, Philadelphia.

EUREKA CEMENT

Will bring out a perfect joint in Gum sections of rubber plates every time. Money will be refunded to any one who, after using according to the new directions, fails to accomplish what advertised. No office right to buy. A sure preventive for dark or spread joints. This cement is prepared expressly for this purpose, and cannot be used for filling teeth. Since the introduction of our Cement, a manufacturer has bought a little carmine at a drug store, colored the powder of his Cement and makes the assertion that he has made it for years. We were the first to prepare a Cement for this purpose. Our packages contain eight times the amount of material sold by other firms.

Price, \$1.00 per package.

BUCK & CO.,

Brockport, N. Y.

FOR SALE BY

JOHNSON & LUND,

20 RACE ST., PHILADELPHIA.

514 WABASH AVE., CHICAGO, ILL.

CHAS. ABBEY & SONS,

DENTISTS' FINE GOLD FOIL.

SOFT, OR NON-ADHESIVE, AND ADHESIVE.

ALL FROM ABSOLUTELY PURE GOLD.



230 Pear Street, Philadelphia.

WATTS'
CRYSTAL GOLD,

\$4.00 per one-eighth ounce.

JOHNSON & LUND,

Philadelphia and Chicago.

NERVE BROACHES,
THE BEST,
Assorted Sizes
75 CTS. - PER DOZEN.

NERVE PASTE.

ARSENIC and CREOSOTE.

35 Cents per Bottle.

SPUNK.

FOR DRYING OUT CAVITIES.

Price, per oz.,..... 20
" in bulk, per lb.,..\$1 25

SEPARATING FILES.

*J. M. EARNEST'S MAKE ARE THE
VERY BEST without doubt.*

No. 000, per dozen,.....\$1 25
All other numbers, per dozen,.... 1 00

JOHNSON & LUND.

THERMOMETERS
For Vulcanizers,
THE MOST RELIABLE.
75 CENTS EACH.

PHENOL SODIQUE,

50 Cents per Bottle.

**FLASKS FOR
VULCANIZING.**

Malleable Iron, Each, - .75
Brass, " " - \$1.00

Orange Wood, for Wedging.

Per bundle, 10 Cts.

DENTAL FLOSS SILK.

Price, plain, per dozen, 90	Price, waxed, per dozen, \$1 15
" " " spool, 15	" " " spool, 15

JOHNSON & LUND, Philadelphia and Chicago.

FRENCH
Separating Files,
"FROIDS,"

Per dozen,.....\$1 25

Shellac Sticks,
FOR
MOUNTING DISKS,

Per box,.....25c.

MEDICINE BOTTLES.

A small square glass bottle, with ground glass stopper, for Office Preparations; the stopper is flat on top, to receive a label.

Per dozen,.....80 c.

Each,.....07 c.

It Retains its Brightness.

It works with great Plasticity, and packs densely.

Oz. Troy.

Extra Amalgam.

GOLD AND

JOHNSON & LUND
LABOR OMNIA VINCIT.

PLATINA ALLOY.

TRADE MARK.
JOHNSON & LUND.

SOLE PROPRIETORS,
620 RACE ST., PHILADELPHIA.
514 WABASH AVE., CHICAGO.

It possesses the greatest possible freedom from shrinkage.

Impervious to the Secretions of the Mouth.

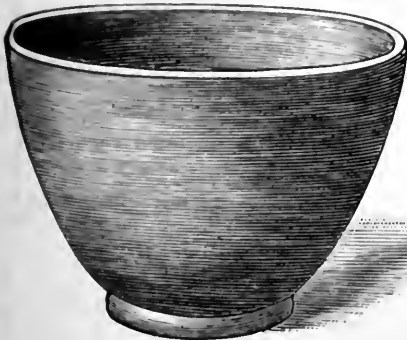
PRICES.

One	Ounce Package.	\$ 3 00
Two-thirds	" "	2 00
One-third	" "	1 00
Two Ounces,	purchased at one time.	5 40
Three	" " " "	7 65
Four	" " " "	9 75
Five	" " " "	11 75
Ten	" " " "	20 00

When money accompanies the order, the Amalgam will be sent postage free.

REDUCTION IN PRICE.

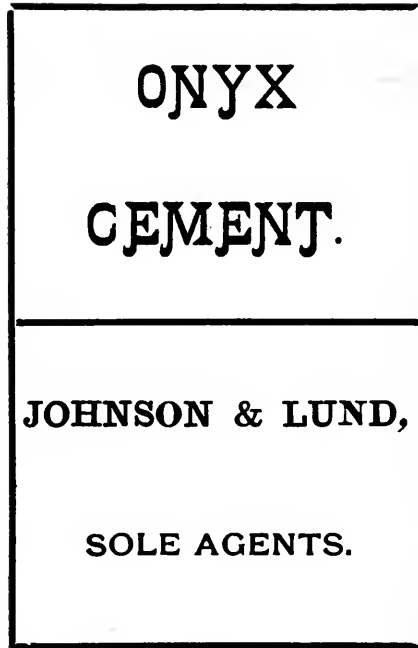
RUBBER BOWL FOR MIXING PLASTER.



These Bowls are made of soft rubber, almost one-eighth of an inch thick. They cannot be broken. Their sides can be pressed together so as to form a lip or spout for pouring out soft plaster. The plaster that remains in them and becomes set can be thoroughly crushed and removed by squeezing the sides of the bowl together.

Inside measurement, $4\frac{1}{4}$ inches in diameter by $3\frac{1}{2}$ inches in depth.

PRICE, 60 CENTS EACH.



ONYX CEMENT.

A PHOSPHATE OF ZINC.

It is the strongest, most dense, and in all respects possesses greater uniformity in all the essentials of a First-Class Filling than any other offered to the profession.

Price, Package containing 1 color,	\$1.00
“ “ 2 colors,	1.50

Each package of the “Onyx” Cement will contain a small piece of the “Asbestos Felt,” so that the operator may have an opportunity of testing its value.

PHOSPHATE OF ZINC.

PREPARED BY DR. C. N. PEIRCE.

The packages will contain a small piece of ASBESTOS FELT, so that those desiring may have the opportunity of testing its value as a lining for cavities, and as a nerve cap.

Price, per Package,	\$2.00.
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JAPANESE BIBULOUS PAPER.

REDUCTION IN PRICE.

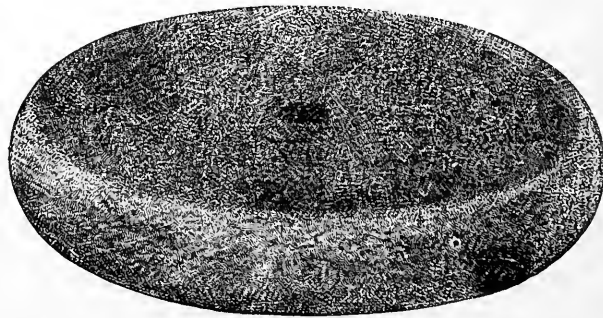
OUR OWN IMPORTATION.

We are just in receipt of a large invoice of Japanese Bibulous paper direct from Yokohama. By importing this absorbent directly from Japan, we save the profits which we have heretofore been obliged to pay to the importers, which enables us to have the pleasure of announcing to the profession a further reduction in price.

Price, per 100 Sheets,	\$.40
“ 500 “	1.75

FELT POLISHING WHEELS.

FINE FELT WHEELS FOR FINISHING.—ROUND EDGE.



Exact Diameter and Thickness of No. 3.

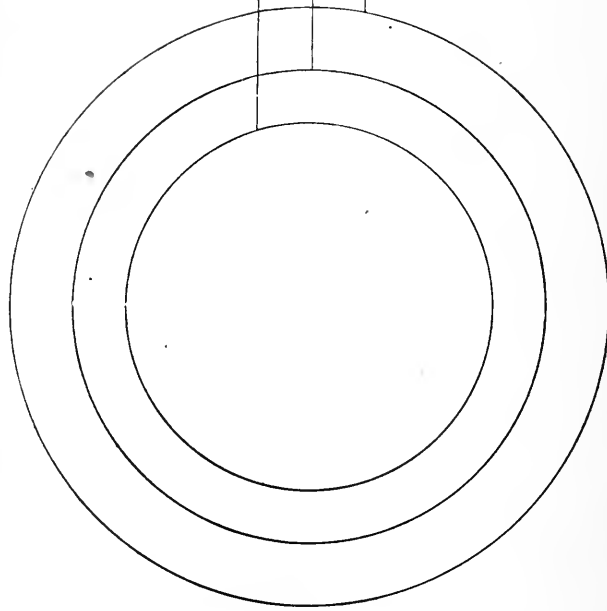


Diagram of Diameters.

No. 1, 1 1/2 in. x 1 1/2 in.	Each, 20 Cents.
No. 2, 2 in. x 1 1/2 in.,	" 30 "
No. 3, 2 1/2 in. x 1 1/2 in.,	" 40 "

16

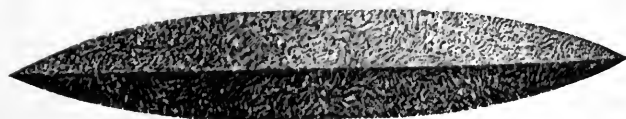
JOHNSON & LUND,

620 RACE STREET, PHILA.

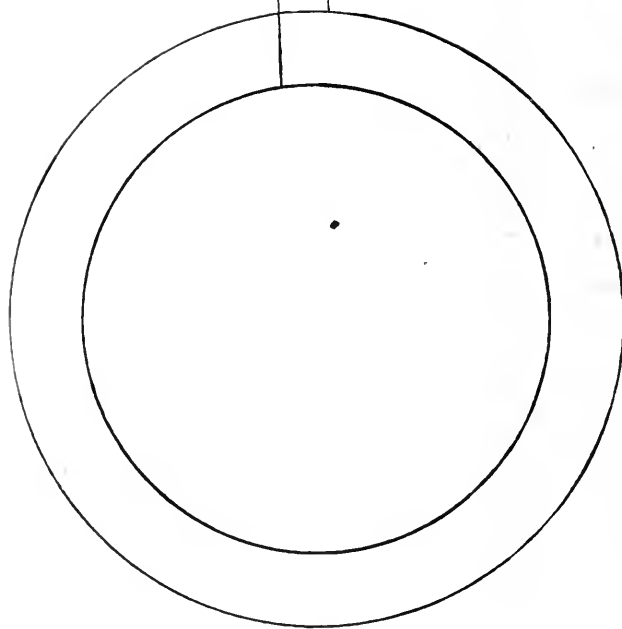
514 WABASH AVE., CHICAGO.

FELT POLISHING WHEELS.

FINE FELT WHEELS FOR FINISHING.—BEVEL EDGE.



Exact Diameter and thickness of No. 2, showing form of Edge.



No. 1, 2 in. x $\frac{3}{8}$ in.	Each, 25 Cents.
No. 2, 2 $\frac{1}{2}$ in. x $\frac{3}{8}$ in.	" 35 "

JOHNSON & LUND,

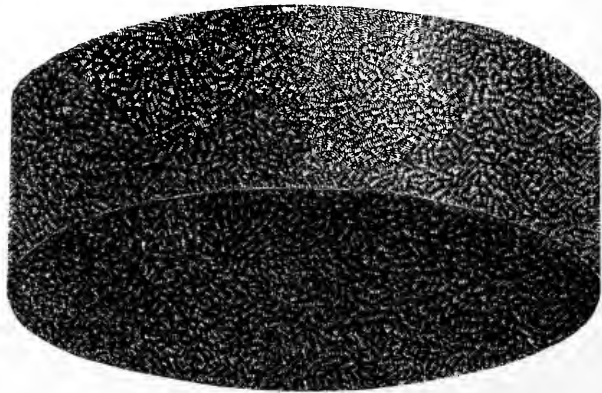
620 Race St., Phila.

514 Wabash Ave., Chicago.

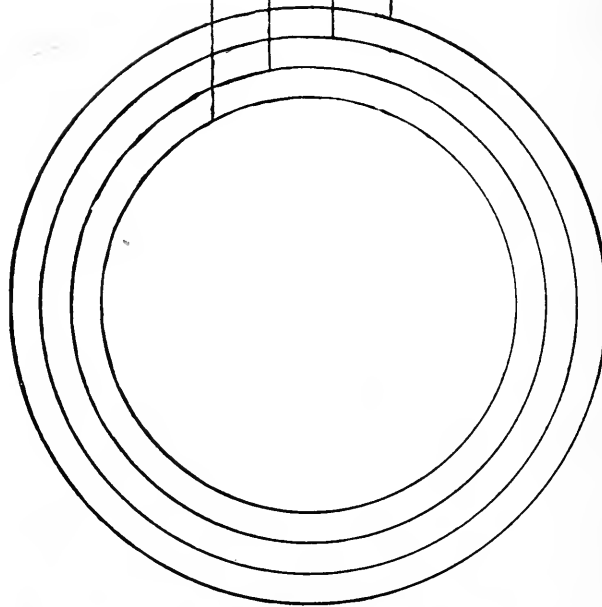
Diagram of Diameters.

FELT POLISHING WHEELS.

COARSE FRENCH FELT WHEELS, FOR ROUGH WORK.—SQUARE EDGE.



Exact Diagram and Thickness of
No. 4.



No. 1, $1\frac{3}{4}$ in. x $\frac{3}{8}$ in.	Each, 10 Cents.	
No. 2, 2 in. x $\frac{3}{8}$ in.	"	13
No. 3, $2\frac{1}{4}$ in. x $\frac{1}{2}$ in.	"	21
No. 4, $2\frac{1}{2}$ in. x $\frac{3}{4}$ in.	"	35

18

Diagram of Diameters.

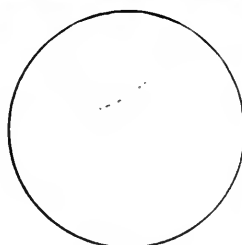
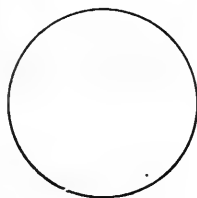
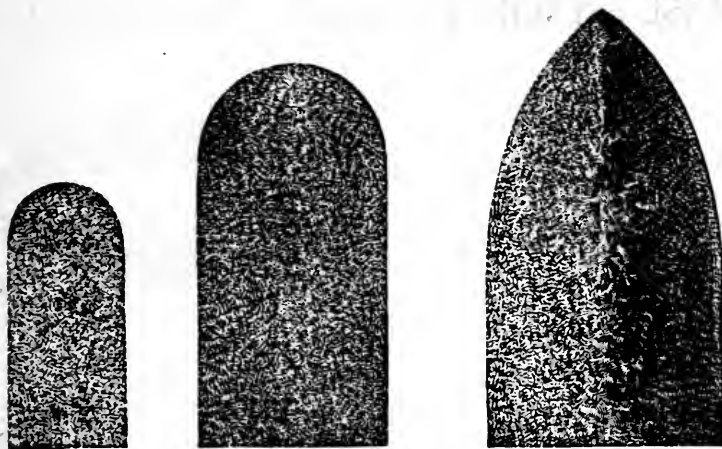
JOHNSON & LUND,

620 RACE STREET, PHILADELPHIA.

514 WABASH AVE., CHICAGO, ILL.

FELT CONES FOR POLISHING.

FINE FELT CONES FOR FINISHING.



No. 1.

No. 2.

Exact Size and Diameter of Cones.

ENGINE CONE FOR POLISHING FILLINGS.

Engine Cone, 1 in. x $7\frac{1}{8}$ Each, 07 Cents

No. 1. $1\frac{1}{2}$ in. x $\frac{3}{4}$ in., for polishing Plates.—either Blunt

or Pointed, “ 20 “

No. 2, $1\frac{3}{4}$ in x $\frac{7}{8}$ in, for Polishing Plates.—Either Blunt

or Pointed, “ 40 “

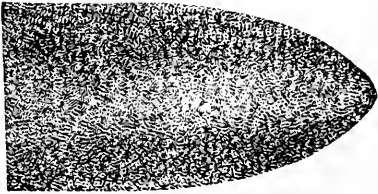
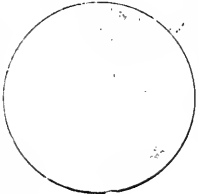
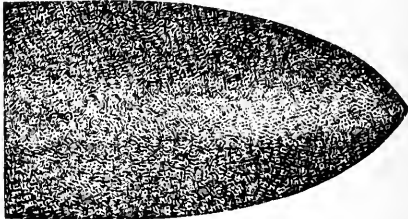
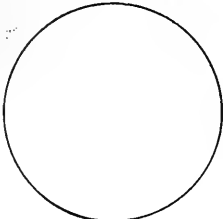
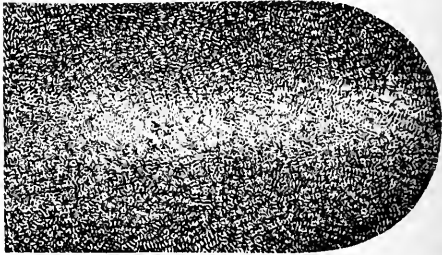
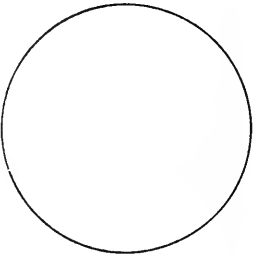
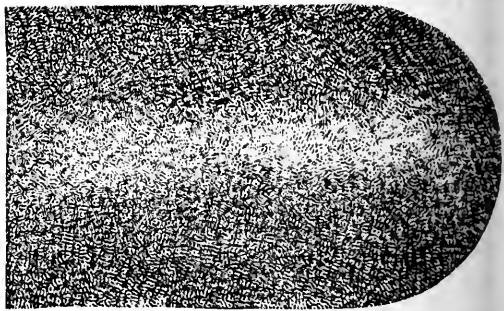
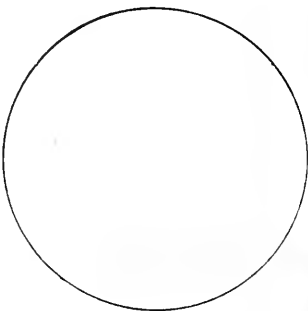
JOHNSON & LUND,

620 Race Street, Philadelphia.

514 Wabash Ave., Chicago.

FELT CONES FOR POLISHING.

COARSE FRENCH FELT CONES, FOR ROUGH WORK.

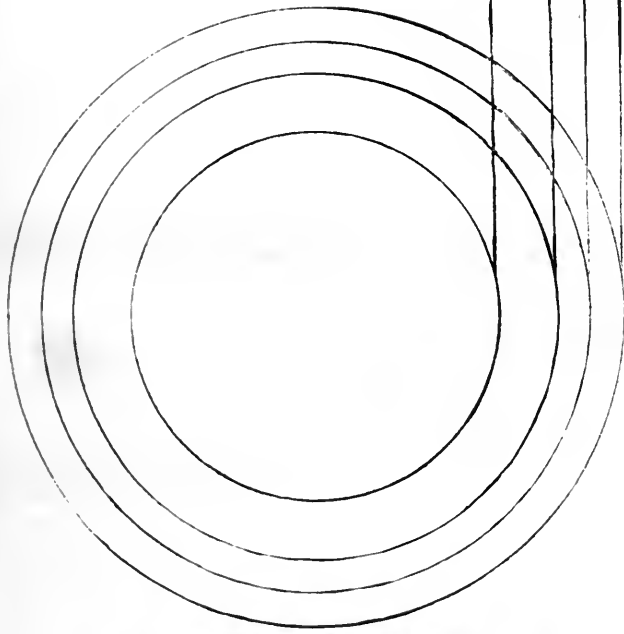
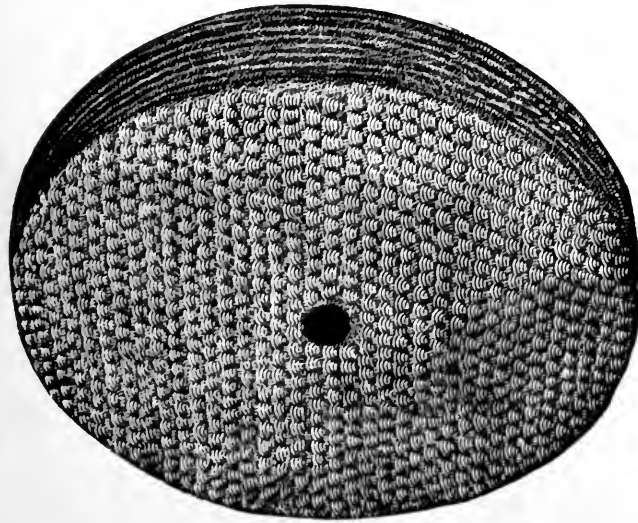
		No. 1.
		No. 2.
		No. 3.
		No. 4.

Exact Sizes and Diameters of French Felt Cones.

No. 1, $1\frac{1}{2}$ in. x $\frac{3}{4}$ in. 15 Cents each	No. 3, $1\frac{3}{4}$ in. x 1 in. 25 Cents each
No. 2, $1\frac{5}{8}$ in. x $\frac{7}{8}$ in. 20	No. 4, 2 in. x $1\frac{1}{4}$ in. 40
“	“

COTTON DUCK WHEELS,

FOR FINISHING PLATES.



No. 1, 1 1/2 in. x 1/2 in.	Each 15 Cents.
No. 2, 2 in. x 1/2 in.	" 25 "
No. 3, 2 1/4 in. x 1/2 in.	" 30 "
No. 4, 2 1/2 in. x 1/2 in.	" 40 "

Diagram of Diameters.

Exact Diameter and Thickness of No. 4.

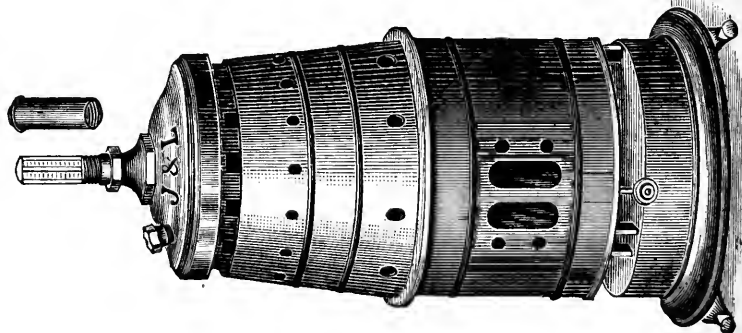
JOHNSON & LUND,

514 WABASH AVE., CHICAGO

620 RAGE STREET, PHILADELPHIA.

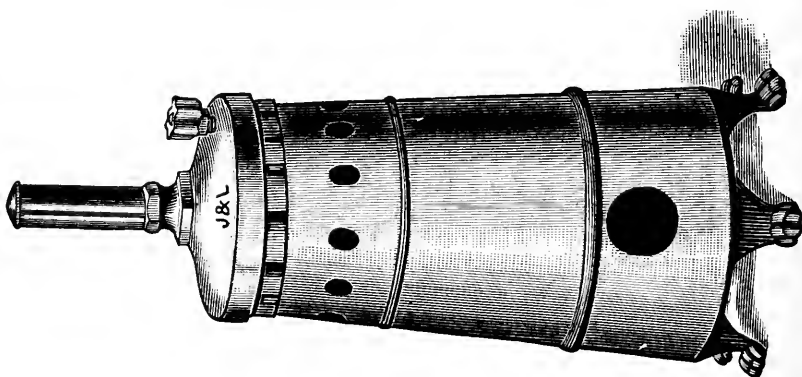
IMPROVED VULCANIZERS, MERCURY BATH, BRASS FLASKS, ETC.

22



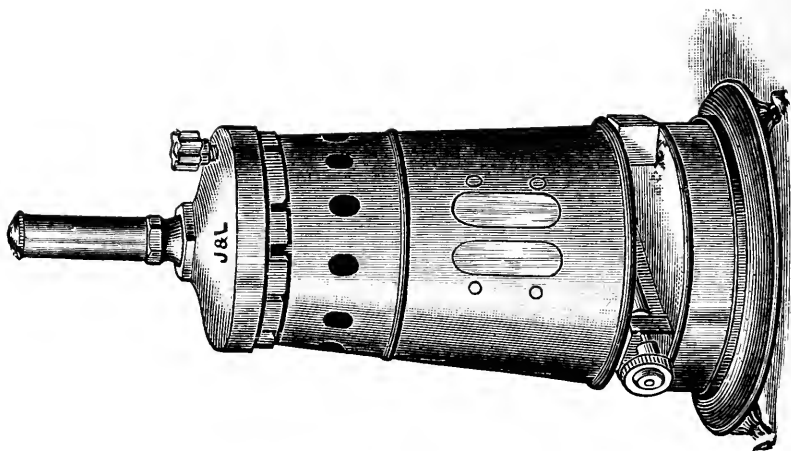
OUTFIT A

Rigged for kerosene with Union stove.
One-case complete with Anchor Flasks, etc., \$14.00
Two-case ditto 15.00
Three-case ditto 16.00



OUTFIT B.

Rigged for kerosene with new attachment.
One-case complete with Anchor Flasks, etc., \$13.00
Two-case ditto 14.00
Three-case ditto 15.00



OUTFIT C.

Rigged for gas or alcohol.
One-case complete with Anchor Flasks, etc., \$13.00
Two-case ditto 14.00
Three-case ditto 15.00

Improved Vulcanizers, Mercury Bath, Brass Flasks, Etc.

These vulcanizers are made in the general style of the "Whitney." The boilers are of extra thick copper, and made much wider than those in ordinary use. The inside diameter of the JOHNSON & LUND Vulcanizer measures fully 4 1/4 inches, while the "Whitney" and "Hayes" measure but 4 inches. The great advantage of this increased diameter will be appreciated at a glance, as it enables the dentist to use the largest size of flasks when necessity demands it. That the profession may be thoroughly satisfied of the ample strength of these vulcanizers, we assure them that each boiler has been tested by and sustained a hydrostatic pressure of 500 lbs. to the square inch; and as the elastic force per lb. to the square inch at 320° Fahrenheit (the degree at which dental plates are generally vulcanized), is but 88 lbs., our Vulcanizers are capable of resisting more than six times the strain required. But this liberality of resisting power is no excuse for carelessness on the part of the operator.

Johnson & Lund's Improved Vulcanizers are furnished with thermometer, mercury bath, one packing in place and an extra piece, extra disks for the safety-valve, requisite number of wrenches, malleable iron or brass flasks at option of purchaser. When no flasks are mentioned the brass ones will always be sent with the apparatus. We especially call attention to the flasks furnished with these Vulcanizers. They are of the pattern known as the **ANCHOR FLASKS**. Owing to their peculiar formation, an extra amount of room is afforded for the case to be vulcanized, and the bolts can be detached and replaced with great facility, without removing the screw from the nut.

PRICES.

Donham's Spring Pressure fitted to a Vulcanizer, adds \$1.25 to the Price.

One-case Vulcanizer, copper boiler, furnished with thermometer, packing jacket, lamp, disks for safety-valve, two flasks (either malleable iron or brass, at the option of the purchaser), and wrenches—complete for alcohol \$13 00
 Ditto—complete for gas 13 00
 Ditto—complete for kerosene 13 00
 Two-Case complete for gas 14 00
 " complete for alcohol 14 00
 " complete for kerosene 14 00
 Three-Case Vulcanizer—complete for gas 15 00
 " —complete for alcohol 15 00
 " —complete for kerosene 15 00
 If the stove part is furnished with the kerosene burner, when sold in connection with the Vulcanizer, there will be an extra charge of 1 00

NOTE.—The kerosene burner we are now furnishing with our Vulcanizer has but one burner; but that burner is four inches wide, instead of only two inches wide, which is the size of the burner belonging to the No. 1 Union Stove. This increased size makes the new burner equal to the two-burner stove, and at no increased expense.

No. 1 Union Kerosene Stove, with one burner two inches wide \$2 00
 " " " " " four inches wide 2 25
 No. 2 " " " two burners each two inches wide 3 00
 Vulcan Gas Stove 1 50

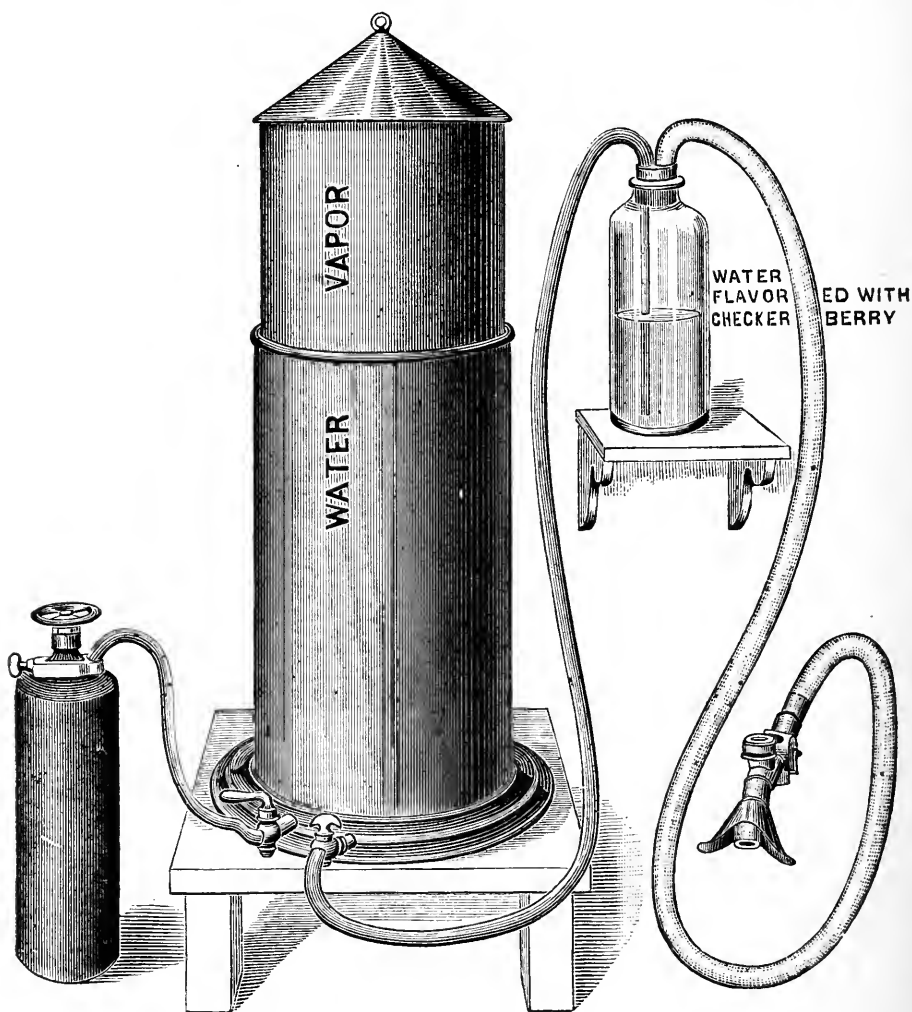
NOTE.—We make no allowance where Vulcanizers with malleable iron flasks are ordered instead of brass ones.

Two-Case Boiler, cover, thermometer, wrenches	\$10 50	Round Wrench for Boiler	25	Felt Wicks for Union Kerosene Stove, 4 in. per doz.	\$1 00
Three-Case " " " "	11 50	Straight " " " "	25	Endless Packing, for J & L's Vulcanizer, each	05
Two-Case Boiler, without cover and thermometer	6 00	Flask Wrench	10	Ordinary " " Whitney " each	60
Three-Case " " " "	7 00	Raised Bed-Plate	\$1 00	" " " " " each	05
Thermometer-Case and Tube, complete	2 00	Bed-Plate and Wrench	50	" " " " " per doz.	60
Outside Thermometer-Case	50	Wrench, double end	25	Alcohol Lamp, for Vulcanizer	10
Inside " " " "	50	Felt Wicks for Union Kerosene Stove, 2 in. each	05	Jackets	60
Cover, with Thermometer-Case and Thermometer	7 00	" " " " " 4 "	10	Thermometers, each	35
" without " " " "	5 00	Canvass Wicks for Union Kerosene Stove, 4 in. each	06	Base, for either alcohol or gas	75
New Ring to Boiler	2 00	" " " " 4 per doz.	60	Gas Burner for Vulcanizer	25
" Bottom to Boiler	2 00	Felt Wicks for Union Kerosene Stove, 2 in. per doz.	60		60

A New Discovery!

A New Discovery!

FAR SUPERIOR TO LIQUID NITROUS OXIDE!

The Vegetable Anæsthetic.

It is without any of the objectionable features peculiar to other Anæsthetics on the contrary it builds up the tissues, quickens the circulation and adds oxygen to the system. The properties of the herbs from which it is manufactured are hypnotic, diaphoretic stimulative and antispasmodic. The patient awakens from the sleep refreshed and cheerful, and reports the sensations and effects as most agreeable. It is given to the youngest children, the most sensitive persons, as well as the aged and enfeebled, and no injury has resulted, or in the nature of the Anæsthetic can result from its inhalation.

As an assurance of the safety and perfect reliability of this new Vapor, we publish the following recommendation from physicians and dentists who have been, and are now, using the new Vegetable Anæsthetic:

"We have used the Vegetable Anæsthetic since January 1886—over a year—*exclusively*, in our practice, both for the extraction of teeth and minor operations in surgery. We have administered it repeatedly in heart disease, severe lung diseases, Bright's disease, etc., etc. where the patients were so feeble as to require

The apparatus consists of a cylinder, gasometer, inhaling bottle and inhaler, together with the different sizes of rubber tubing necessary. The advantages of a gasometer over a gas-bag must be self-apparent. The Vapor left in a bag after an operation soon evaporates; but it will remain in a gasometer an indefinite time. It is much more convenient and always ready.

DIRECTIONS.—Fill the tank to within a few inches of the top with water; balance the upper part of gasometer so that a faint bubble will be forced from the water in the bottle. Fill the bottle with water sufficient to cover the perforated holes in long glass tube, and flavor slightly with checkerberry; change the water—say every 100 gallons of vapor used.

Gasometer, with double wall and spigot for waste water.....	\$13	00
100 gallon Cylinder, empty.....	10	00
200 " " " ".....	10	00
500 " " " ".....	22	00
100 Gals. Vapor. 5c. per gal.....	5	00
200 " " " 4c. ".....	8	00
500 " " " ".....	17	50
Connection.....	1	00
Indicator and Safety Bottle.....	2	00
Inhaler, Improved.....	10	00
Rubber Face Piece.....	1	00
Small Rubber Tubing..... per foot	16	
Medium " "..... "	25	
Large Size " "..... "	35	
Tripod for 100-gal. cylinder.....	4	00
" " 200-gal. ".....	5	00
1 oz. Checkerberry.....	50	
Boxing Extra.....		

Analysis of Vapor made by James F. Babcock, Analytical and Consulting Chemist, State Assayer and Inspector of Liquors, late Professor of Chemistry in Boston University and Massachusetts College of Pharmacy.

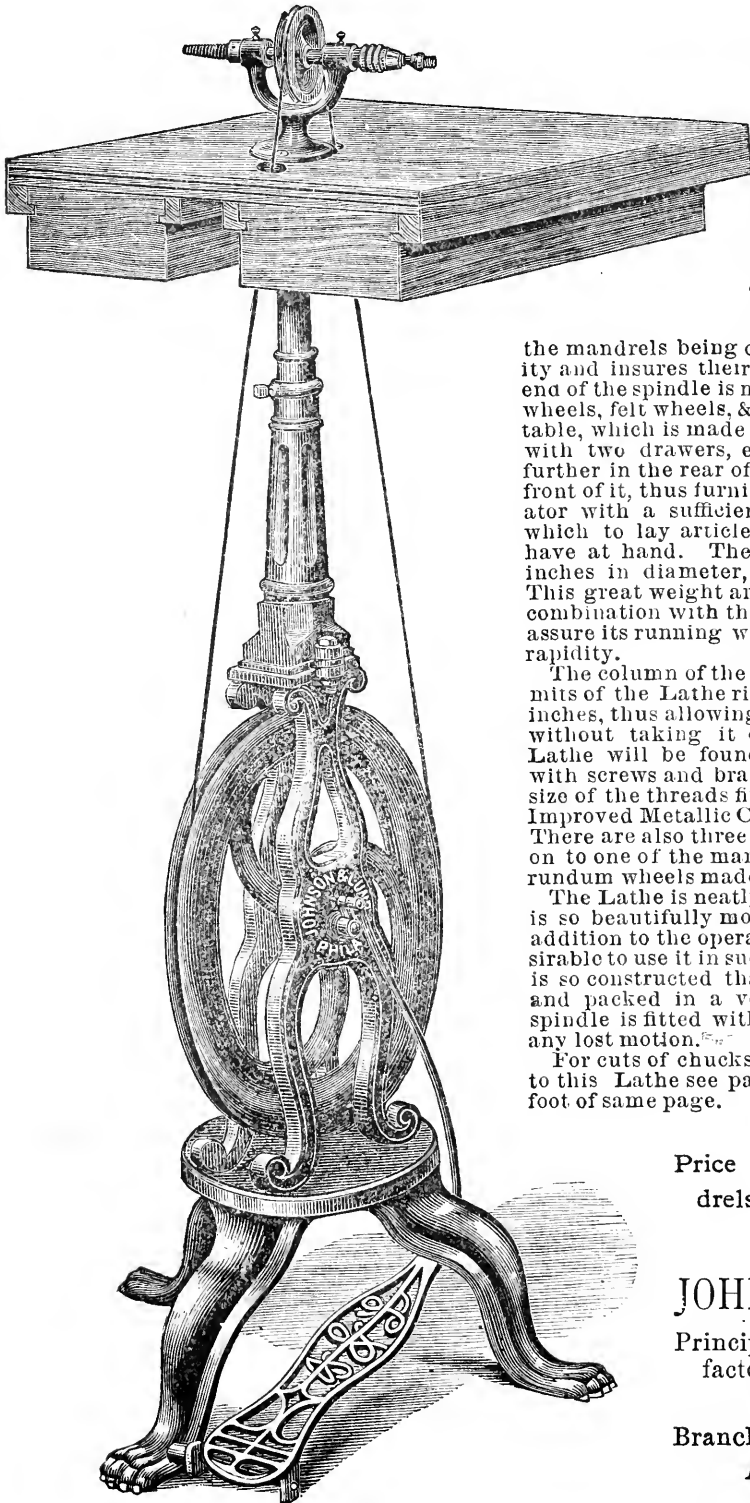
Gentlemen—I have made a chemical analysis of a cylinder containing one hundred gallons of the Anæsthetic manufactured by your Company, and find that the same consists of a basis of nitrous oxide, combined with the volatile active principles of several well-known vegetable anodynes and sedatives, which are calculated to increase its efficiency. I find the Anæsthetic to be free from *chloroform* (which has sometimes been detected in compressed gas), and that it is likewise free from any dangerous or objectionable constituents. I cheerfully recommend this Anæsthetic to dentists and others as worthy of general confidence.

JAMES F. BABCOCK.

JOHNSON & LUND.

514 WABASH AVE., CHICAGO.

JOHNSON & LUND'S Improved Dental Lathe, No. 1.



It is with much pleasure that we are able to resume selling our No. 1 Improved Dental Lathe at the old price, viz., \$17.00.

In the construction of this Lathe we have introduced several novelties which only need to be seen to be appreciated. In the first place, one end of the spindle is made with a split-chuck and collar, which admits of the mandrels being changed with great facility and insures their running true; the other end of the spindle is made taper, to carry brush wheels, felt wheels, &c. In the next place, the table, which is made of solid walnut and fitted with two drawers, extends about 1½ inches further in the rear of the head than it does in front of it, thus furnishing the dentist or operator with a sufficiency of table room upon which to lay articles that it is desirable to have at hand. The driving-wheel is fifteen inches in diameter, and weighs 24 pounds. This great weight and enlarged diameter, in combination with the small size of the pulley, assure its running with great ease, power and rapidity.

The column of the Lathe, being hollow, permits of the Lathe rising and falling over six inches, thus allowing the cord to be tightened without taking it off. Accompanying the Lathe will be found three mandrels, fitted with screws and brass shoulders, one for each size of the threads fitted in Johnson & Lund's Improved Metallic Centre Corundum Wheels. There are also three brass chucks which screw on to one of the mandrels, for using with corundum wheels made without metal centres.

The Lathe is neatly painted and gilded, and is so beautifully modeled that it is quite an addition to the operating room, when it is desirable to use it in such a position. The Lathe is so constructed that it can be taken apart and packed in a very small compass. The spindle is fitted with an appliance to take up any lost motion.

For cuts of chucks and mandrels belonging to this Lathe see page 9 of adv. and note at foot of same page.

—o—
Price Complete, with Mandrels and Chucks, boxed,
\$17.00.

JOHNSON & LUND

Principal Depot and Manufactory, 620 Race Street,
Philadelphia.

Branch Depot, 514 Wabash
Avenue, Chicago.

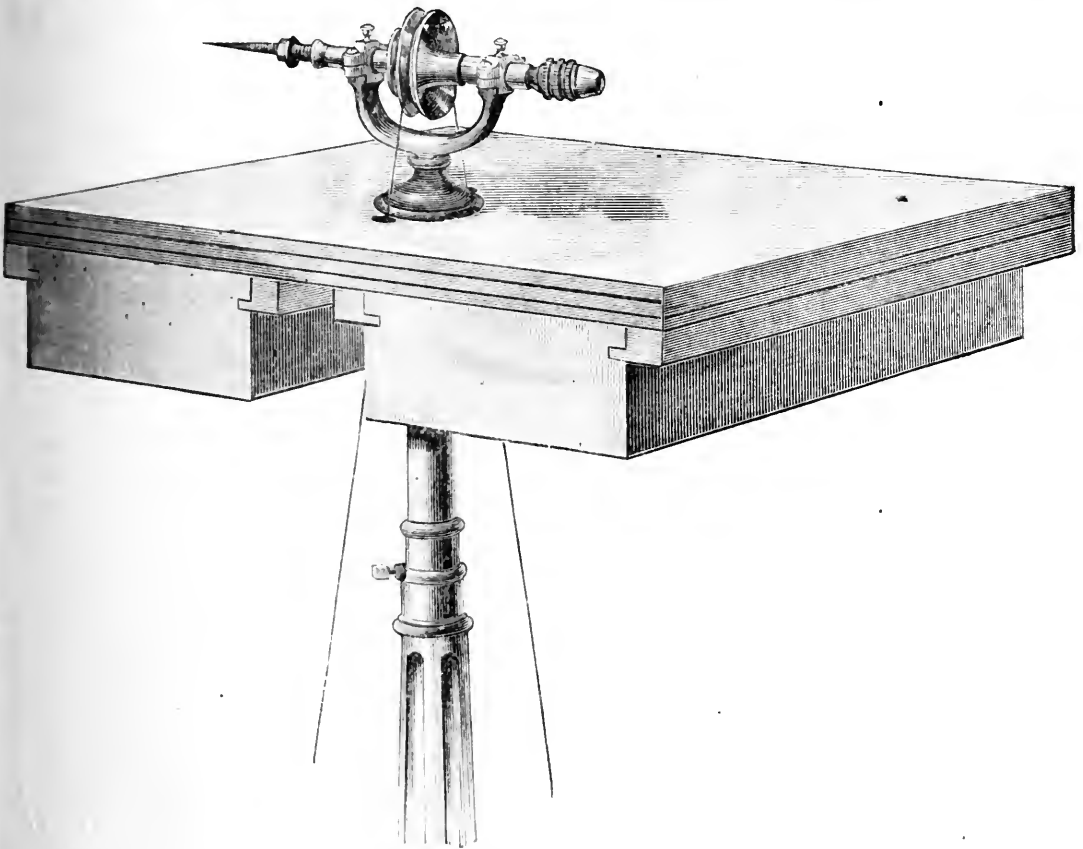
NOTICE.

It is with much pleasure that we are enabled to resume selling our No. 2 Improved Lathe at \$22.00.

JOHNSON & LUND'S

IMPROVED

DENTAL LATHE, No. 2.



The stand and table of this Lathe are precisely the same as the stand and table of J. & L. Improved Lathe. (See opposite page.) The Lathe Head is an exceedingly fine article; the workmanship and materials being of the very best quality. The bearings are accurately fitted and so arranged that any lost motion which may occur by wear can be taken up with rapidity and accuracy. It is furnished with a cone-screw on one end and a split-chuck upon the other. The chuck is made with a cross-pin at the rear end, which is grasped by the split ends of the Mandrels, thus giving them very long bearings. The oil holes are covered with handsome metal screw caps. The spindle and pulley wheels are highly finished and the frame work is Japanned. The Lathe is so constructed that it can be packed in a very small compass.

PRICE.

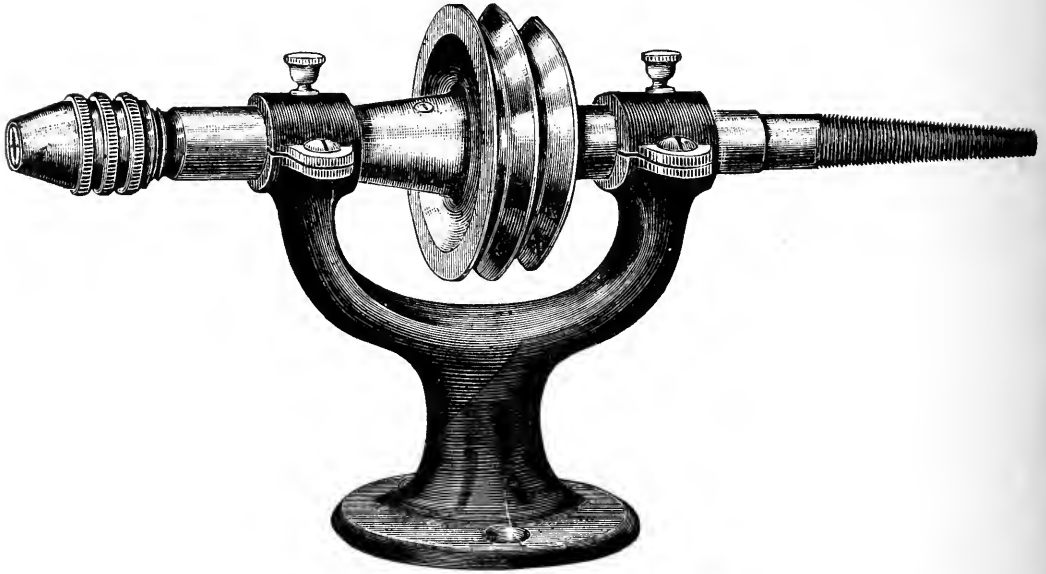
Lathe Complete, with ten Chucks,	-	-	\$22.00
" Without Chucks,	-	-	19.00

For cuts of the ten Chucks and Mandrels, see page 29 of adv.

JOHNSON & LUND,

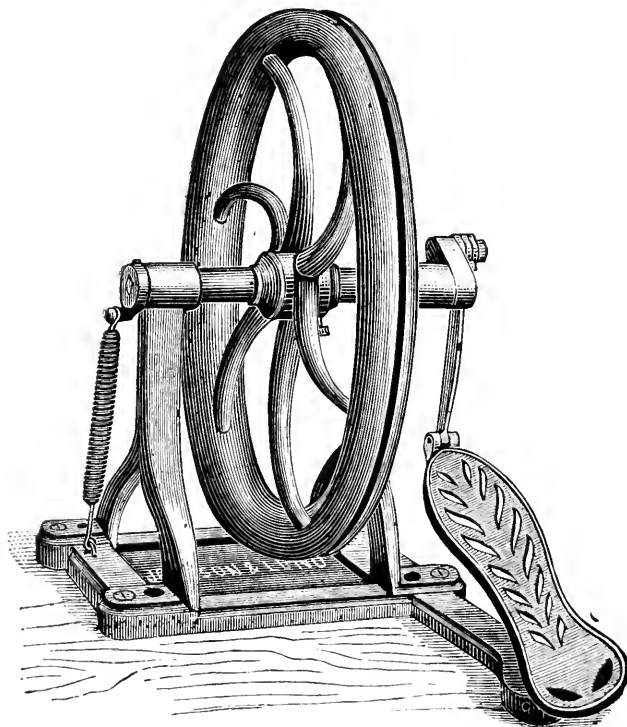
Principal Depot and Manufactory, 620 Race Street, Phila. Branch Depot, 514 Wabash Avenue, Chicago.

LATHE HEAD, NO. 1.



This Lathe Head is furnished with a split-chuck and collar, which allow the mandrels to be changed with great facility, and insures their moving true; the other end of the spindle is made taper to carry brush wheels, felt wheels, &c. Accompanying the Head will be found three mandrels, fitted with screws and brass shoulders, one for each size of the threads, fitted in Johnson & Lund's Improved Metallic Centre Corundum wheels. There are also three brass chucks, which screw on to one of the mandrels, for using corundum wheels made without metal centre. For the cuts of the mandrels and chucks belonging to this Lathe Head see page 29 of adv. and note at bottom of same page. PRICE COMPLETE, WITH MANDRELS AND CHUCKS, \$6.00.

The Lawrence Driving-Wheel.



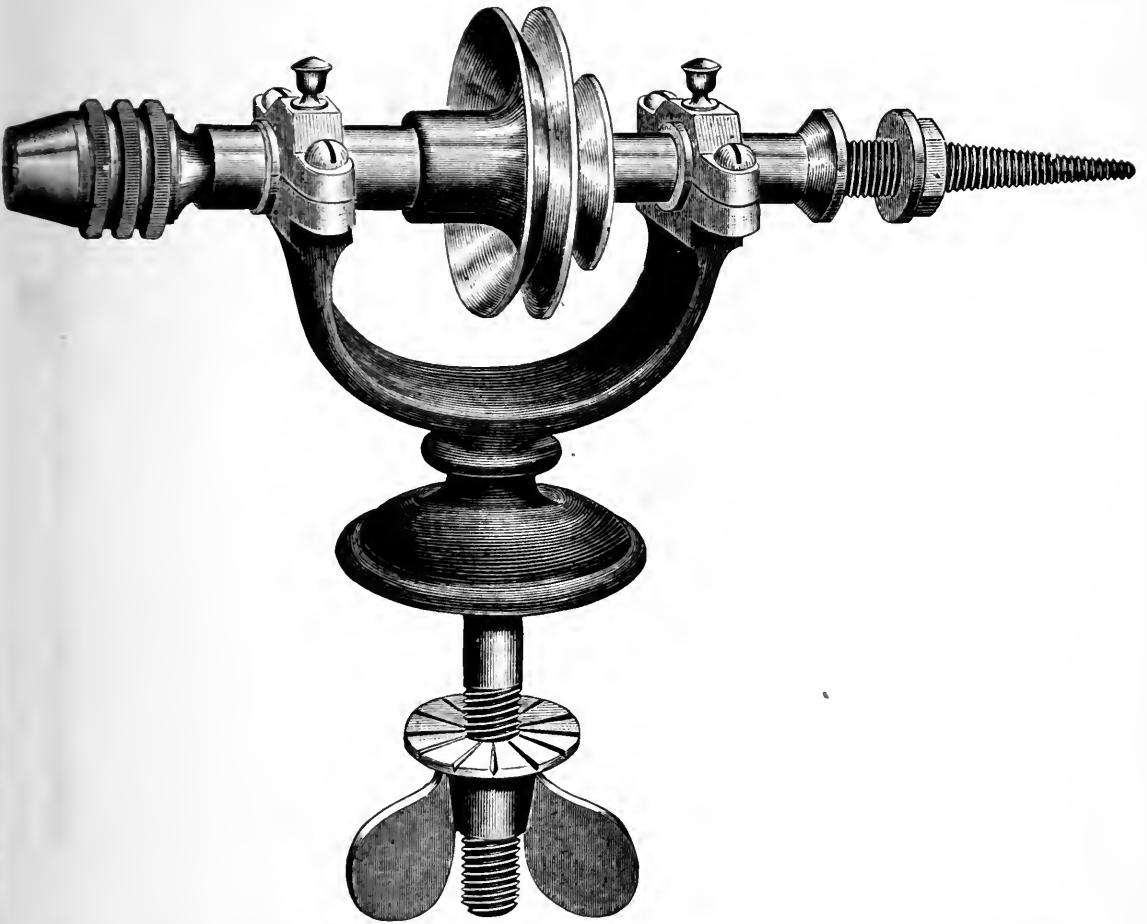
This is by far the most serviceable foot-power ever offered for general use to the profession. The Wheel measures $18\frac{1}{2}$ inches in diameter, and weighs 45 pounds. The entire apparatus is handsomely painted, and each wheel is furnished with a spring, for the purpose of keeping the wheel, when at rest, off the centre and ready for action.

The cut is a faithful representation of the article itself.

—o—

Driving-Wheel	\$11.00
Cord and Couplings . . . .	.50

LATHE HEAD, No. 4.

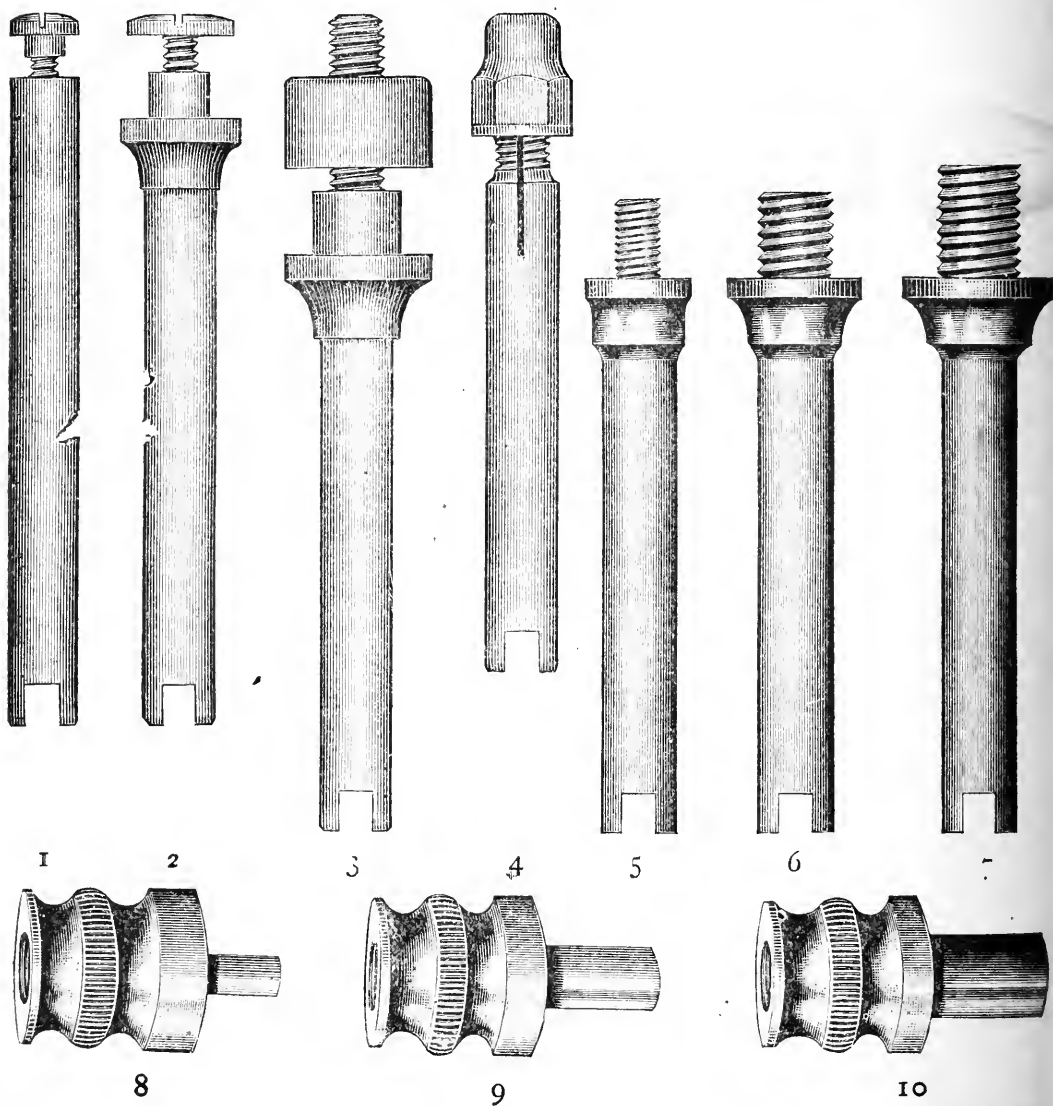


This Lathe Head in connection with the Lawrence Driving Wheel, makes the most complete and satisfactory Dentist's Lathe in the market. It is the best article of the kind ever offered. The workmanship and materials used are of the very best quality. The bearings are accurately fitted and so arranged that any lost motion which may occur by wear can be taken up with rapidity and accuracy. It is finished with a cone-screw on one end and a split-chuck upon the other. The chuck is made with a cross-pin at the rear end, which is grasped by the split ends of the mandrels, thus giving them very long bearings. The oil holes are covered with handsome metal screw caps. The spindle and pulley-wheel are highly finished and the frame work Japanned. Ten chucks and mandrels are supplied with the lathe, if desired. For cuts of chucks and mandrels see page of advertisements and note at foot of page 29.

PRICE.

Head complete, with ten chucks,	-	-	-	\$11 00
Head, without chucks,	-	-	-	8 00

CHUCKS AND MANDRELS FOR LATHE-HEAD NO. 4, AND JOHNSON AND LUND'S IMPROVED LATHE NO. 2.



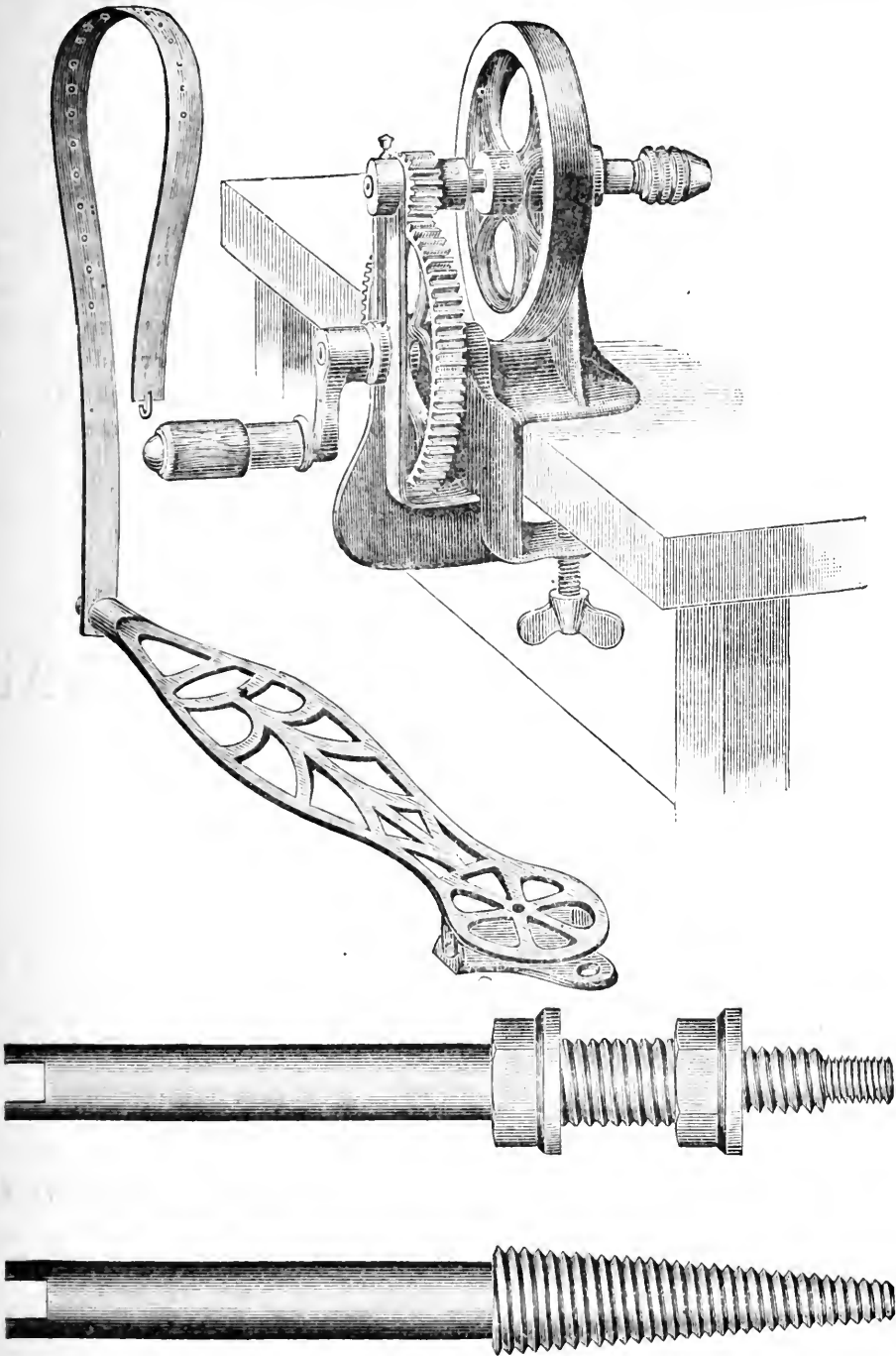
Nos. 1, 2 and 3 are screw chucks for corundum wheels, &c. No. 4 will carry engine burs, drills and tools. Nos. 5, 6 and 7 are screw mandrels for the improved metal-centre corundum wheels. Nos. 8, 9 and 10 are brass chucks fitting upon No. 7, and are intended for shellacing corundum wheels on.

PRICE.

Set of ten Chucks,	-	-	-	\$3 50
No. 1,	\$ 30	No. 5,	-	35
No. 2,	45	No. 6,	-	40
No. 3,	60	No. 7,	-	45
No. 4,	1 00	No. 8, 9, 10, each,	-	25

NOTE.—A set of Chucks to accompany Improved Lathe No. 1. Lathe Head No. 1 and Socket Lathe Head, consists of Nos. 5, 6, 7, 9, 8, 10. Illustrated above.

HAND AND FOOT LATHE.



The above cut illustrates our HAND AND FOOT LATHE. It is made with a Split-Chuck similar to the one fitted to our Improved Dental Lathe and various Lathe Heads. It is furnished with a taper Mandrel for the accommodation of Brush Wheels, Felt Wheels, Cones, etc., and with a Universal Mandrel which will fit any size of Corundum Wheel, Cone or Cup, made with the Improved Brass Centre, from the very smallest to the largest and thickest sizes. We also send with the Lathe three brass Chucks (illustrated on page 29 of adv.), which screw upon the Universal Mandrel for the convenience of those preferring to use Corundum Wheels without the metallic centre. The Lathe weighs, with two Mandrels and three brass Chucks, complete, seven pounds and twelve ounces. The geared wheels are machine-cut, and the workmanship throughout is of the best description.

PRICE, COMPLETE.....\$6.50.

SOCKET LATHE HEAD.

This Lathe Head is so constructed that it can be raised or lowered $4\frac{1}{2}$ inches. this admits of its being made to suit the height of the operator, and also to tighten the cord, without removing it from the Lathe. This Lathe Head is furnished with a split-chuck and collar, which admit of the mandrels being changed with great facility, and insuring their running true. The other end of the spindle is made taper, to carry brush wheels, felt wheels, &c. Accompanying the Lathe will be found three mandrels, fitted with screws and brass shoulders, one for each size of the threads fitted to Sohnsen & Lund's corundum wheels. There are also three brass chucks which screws on one of the mandrels, for using corundum wheels made without metal centres. For cuts of the mandrels and chucks which accompany this Lathe Head see page 29 of adv. and note at bottom of same page.

Price complete, with Mandrels and Chucks,\$7.00.

TWILLED RUBBER DAM.

A MOST EXCELLENT ARTICLE.

Highly prized by many on account of its twilled surface

This Dam is only made 30 inches wide.

Thin, per yard,	-	-	-	-	\$1 00
Medium, "	-	-	-	-	1 50
Thick "	-	-	-	-	2 00

JOHNSON & LUND,

620 RACE ST., PHILA.,

514 WABASH AVE., CHICAGO.

M. H. SPENCER & CO.,

195 AND 197 W. SEVENTH STREET,

CINCINNATI, OHIO.

DEALERS IN

Artificial Teeth and all varieties of Dental Goods.

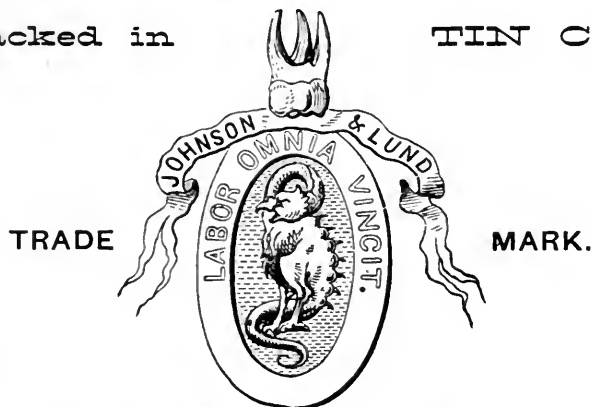
RUBBER DAM IN TINS

1-2 POUND, \$1.50.

Extra Tough Coffer-Dam Rubber.

Packed in

TIN CANS.



Manufactured Expressly for

JOHNSON & LUND,

620 RACE STREET, Phila.

514 WABASH AVENUE, Chicago, Ills.

We take pleasure in calling the attention of the profession to a new article of Rubber Dam, made in the most careful manner of the best Para Rubber, no adulterations being used in the manufacture, the Dam consisting entirely of Rubber, sufficient of sulphur only being used to properly vulcanize it. It is cut in strips $8\frac{1}{2}$ inches wide and from $3\frac{1}{2}$ to 4 yards long, being a very handy size for general use. It is packed in METAL TUBES with a MOVABLE LID made as nearly AIR TIGHT as possible, in which the Dam can be kept, thus assisting very materially in preserving the strength of the material.

PRICE

Per can containing $\frac{1}{2}$ lb. Thin,	-	-	-	per yard,	\$1 00
" " $\frac{1}{2}$ " Medium,	-	-	-	"	1 50
" " $\frac{1}{2}$ " Thick,	-	-	-	"	2 00

Sent Postage Free on receipt of price.

Rubber Dam by the Yard.

35 Inches Wide. There is none made wider.

The Best Coffer-Dam Rubber,

Impossible to make any better—35 inches wide.

The above Rubber-Dam is made especially for us and to our own particular order, so that we know just what we offer to the profession and what we know is, that it is impossible to make any better. Some time since we were obliged to buy some Coffer-Dam Rubber, which was advertised as a VERY SUPERIOR ARTICLE to supply a customer who was impressed with the advertisement of the same, the result was, that he found it tender and returned it to us unfit to be used, we replaced it with our own; with which he was very well satisfied.

Thin,	-	-	-	per yard,	1 00
Medium,	-	-	-	"	1 50
Thick,	-	-	-	"	2 00

CAUTION.

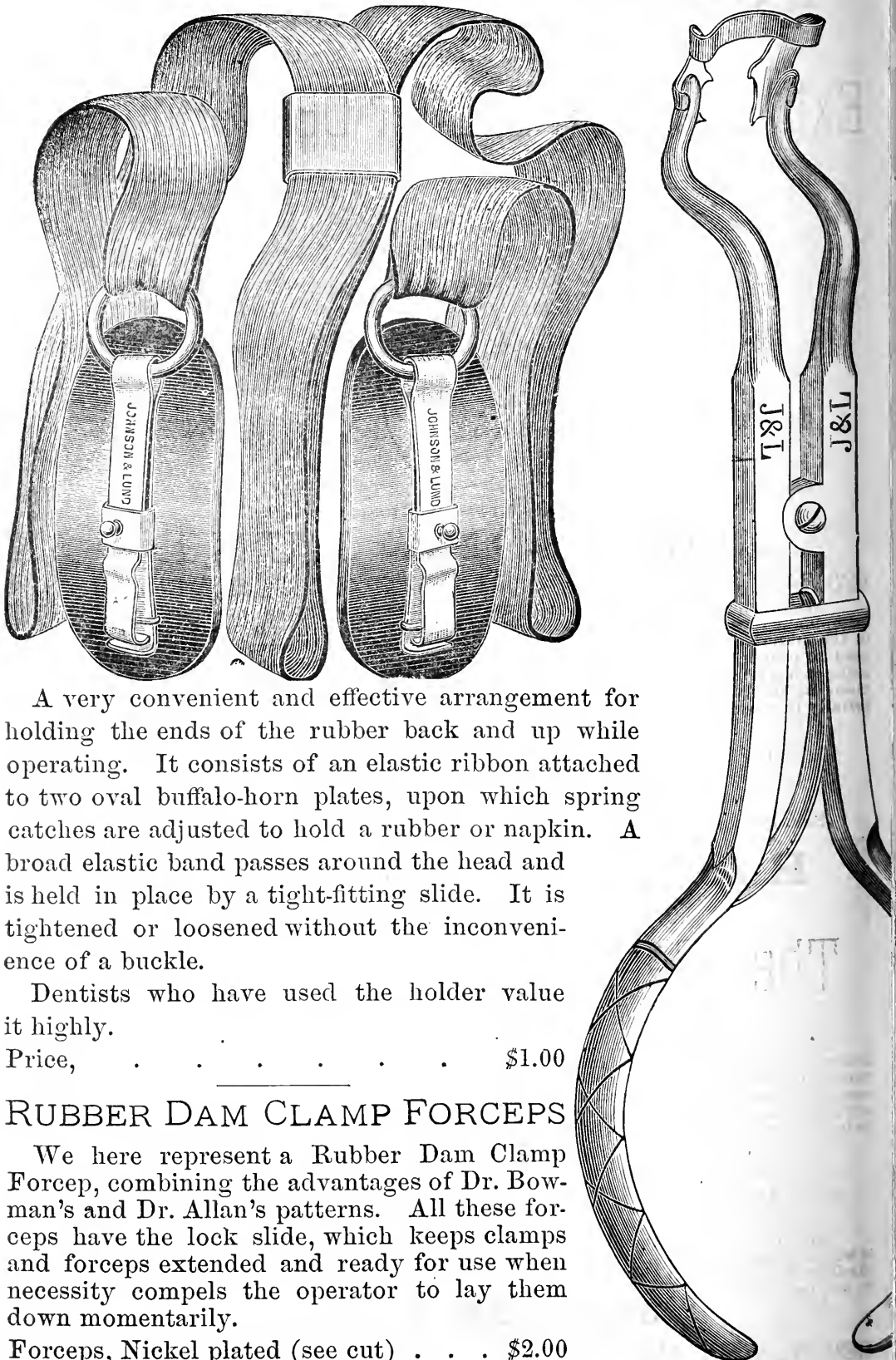
Much of the Coffer-Dam Rubber advertised by other depots, and offered by their travelers is but $26\frac{1}{4}$ inches wide, is 20 per cent. less material to the yard than ours. For instance, our Medium 35 inch wide at \$1.50 per yard is as cheap as $26\frac{1}{4}$ inch of equal quality would be at \$1.12 $\frac{1}{2}$ per yard.

JOHNSON & LUND,

620 Race St., Philadelphia.

514 Wabash Ave., Chicago.

RUBBER DAM AND NAPKIN HOLDER DR. COGSWELL'S.



A very convenient and effective arrangement for holding the ends of the rubber back and up while operating. It consists of an elastic ribbon attached to two oval buffalo-horn plates, upon which spring catches are adjusted to hold a rubber or napkin. A broad elastic band passes around the head and is held in place by a tight-fitting slide. It is tightened or loosened without the inconvenience of a buckle.

Dentists who have used the holder value it highly.

Price, \$1.00

RUBBER DAM CLAMP FORCEPS

We here represent a Rubber Dam Clamp Forcep, combining the advantages of Dr. Bowman's and Dr. Allan's patterns. All these forceps have the lock slide, which keeps clamps and forceps extended and ready for use when necessity compels the operator to lay them down momentarily.

Forceps, Nickel plated (see cut) . . . \$2.00

RUBBER DAM APPLIER.

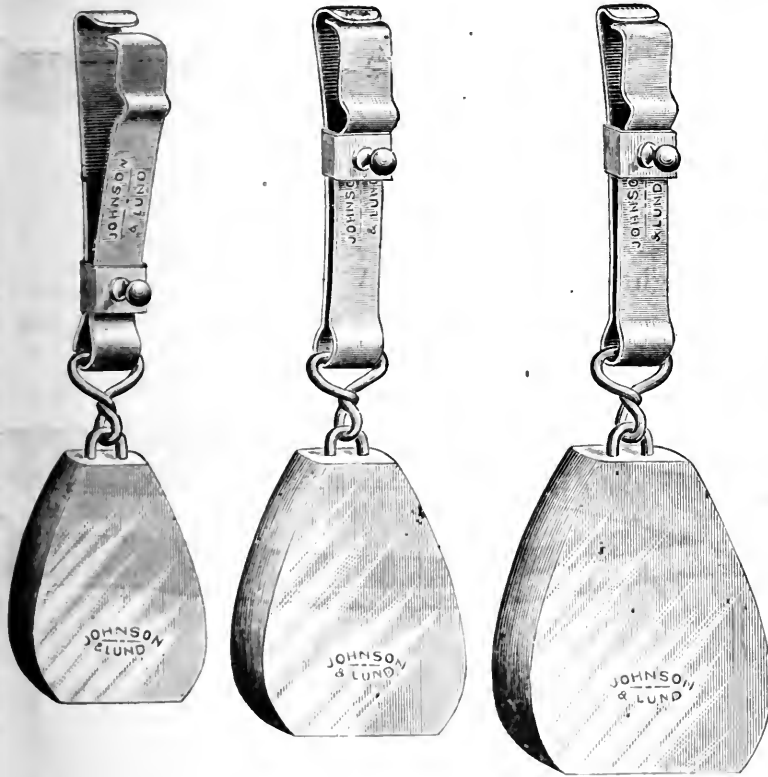


This instrument is designed for placing Rubber Dam between the back teeth. By passing the twine through the holes in the prongs of the instrument, and bringing the ends with one turn around the button, so as to keep it taut, and moving it with a lateral motion, the Rubber will be forced between the teeth.

PRICE.

With $\frac{1}{4}$ inch plain octagon, Steel handle, ball ends (see cut), each,	\$1.25
“ “ “ “ “ “ “ “ Nickel Plated (see cut),	1.50

RUBBER DAM WEIGHTS AND SPRINGS.



These weights are intended to be attached to the lower margin of the Dam, when in use, serving to keep it out of the way of the operator.

They are of metal, handsomely nickel plated. The springs are of stiff metal, nickel plated. They are readily attached and removed from the Dam without tearing it.

There are three sizes. The small size weighs 1 ounce; the medium size weighs $1\frac{1}{2}$ ounces; the large size weighs $1\frac{3}{4}$ ounce.

Price, with Spring, each, . 40cts.

WOOD POLISHING POINTS.

Put up in Boxes containing 100 Points each.

Assorted, eight forms, per box.....\$1.00

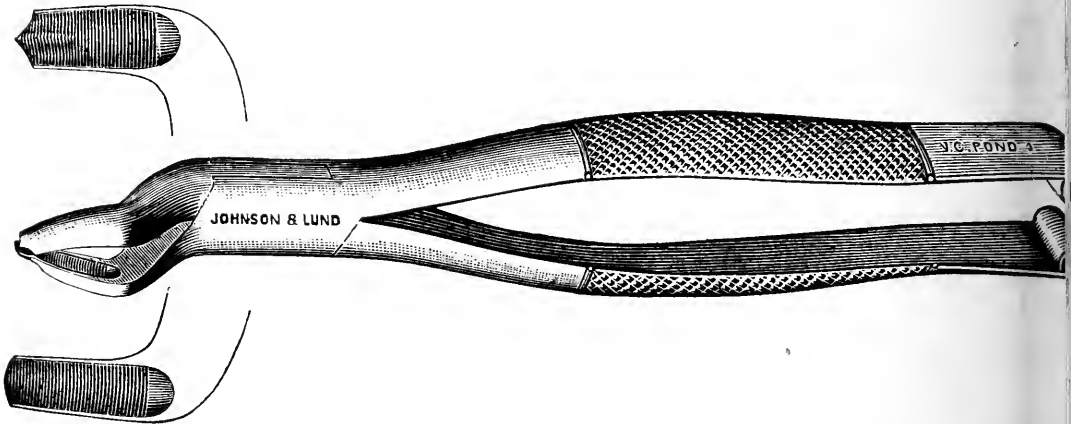
SEARATELX.

No 1, per box,	\$1.00	No. 2, per box,	\$1.60.	No. 3, 5 and 6, per box,	80 Cents.
No. 4, “	2.40	No. 7, “	1.25.	No. 8, “	50 “

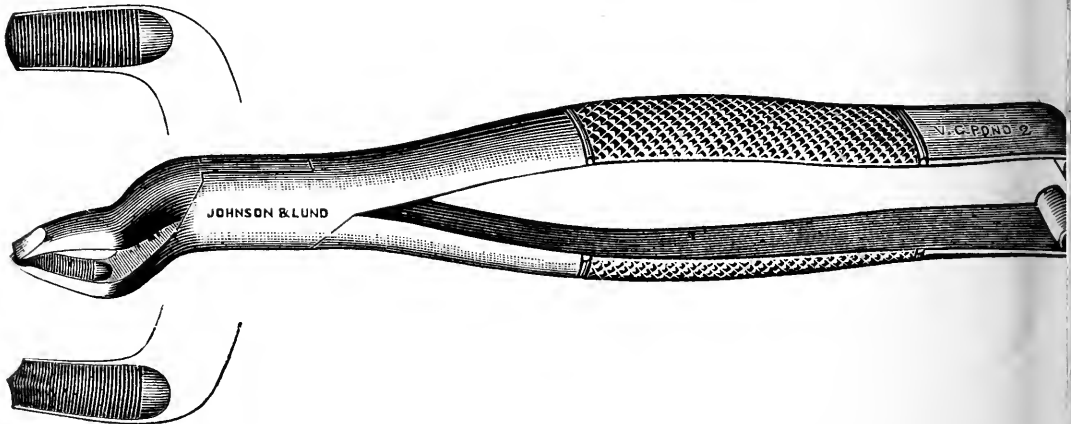
Dr. V. C. Pond's Set of Forceps.

The ends of the handles are rounded to fit the palm of the hand, so that the beaks can be readily forced between the tooth and the alveolus. All are made with oval joints, nickel-plated.

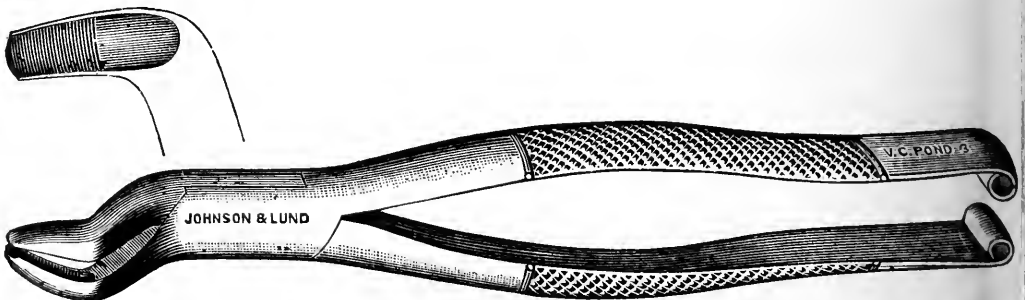
Price, Each, \$2.25



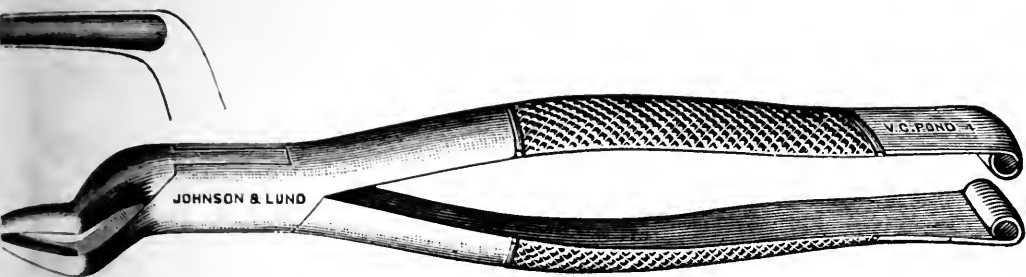
No. 1. Right Upper Molar.—V. C. Pond's.



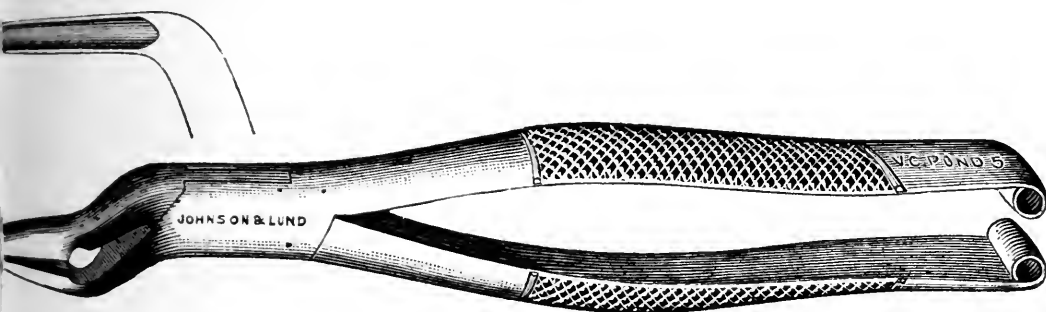
No. 2. Left Upper Molar.—V. C. Pond's.



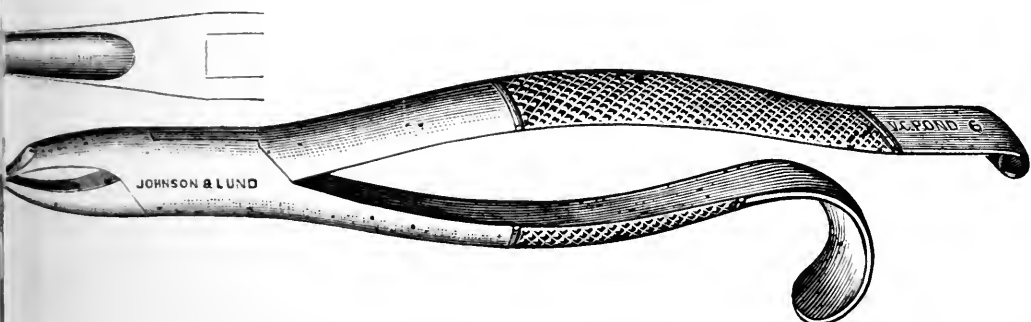
No. 3. Upper Wisdom, Right and Left.—V. C. Pond's.



No. 4, Bayonet Shape, Bicuspid and Lateral.—V. C. Pond's.



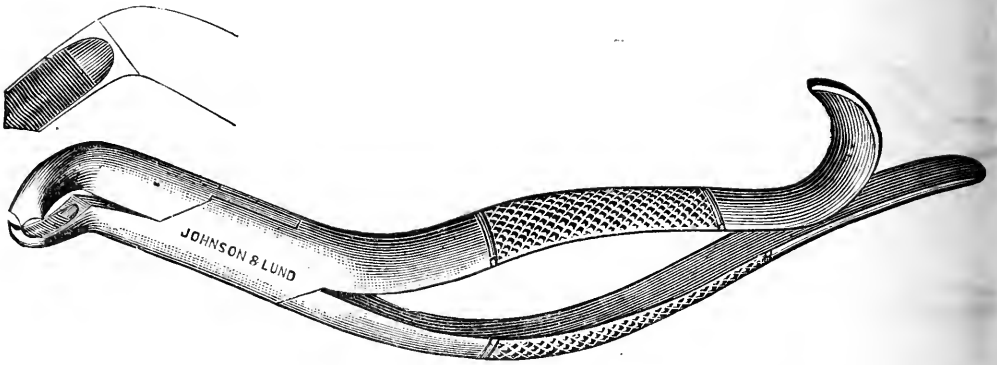
No. 5, Bayonet Shape, upper alveola root.—V. C. Pond's.



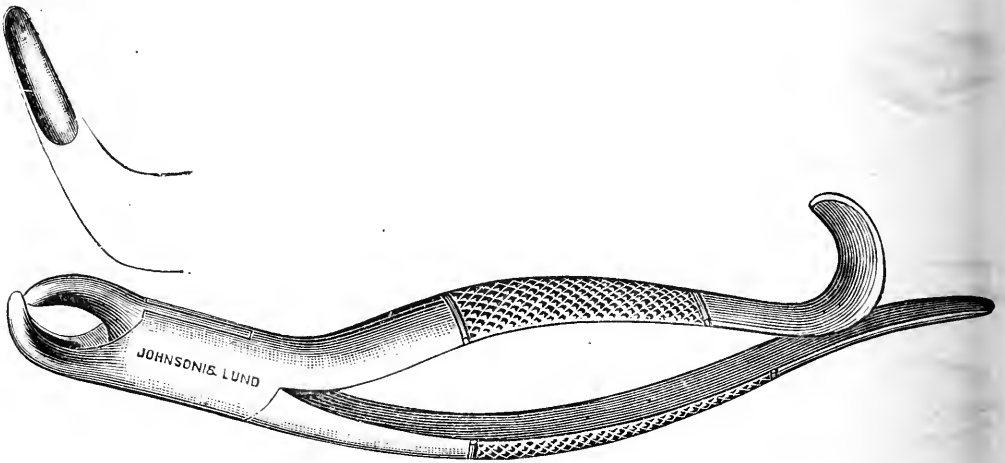
No. 6, Upper Central.—V. C. Pond's.



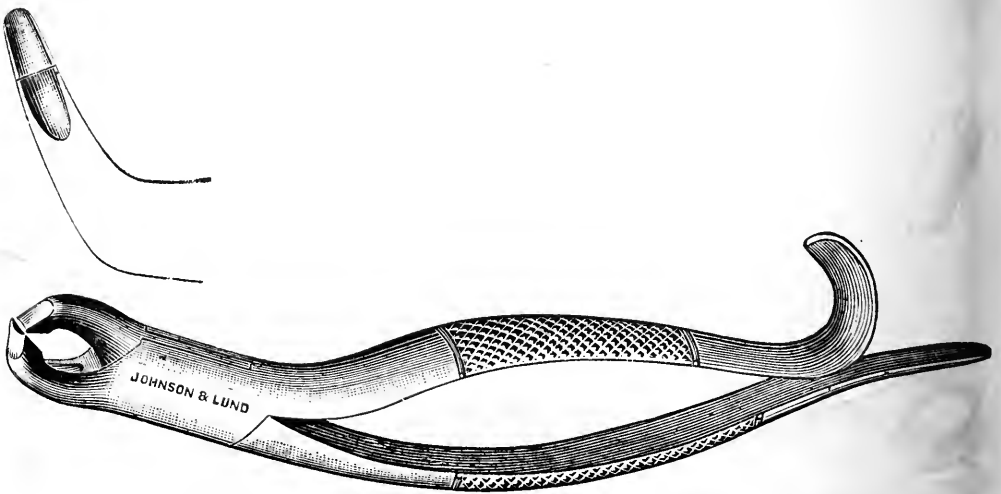
No. 7, Lower Molar, either side.—V. C. Pond's.



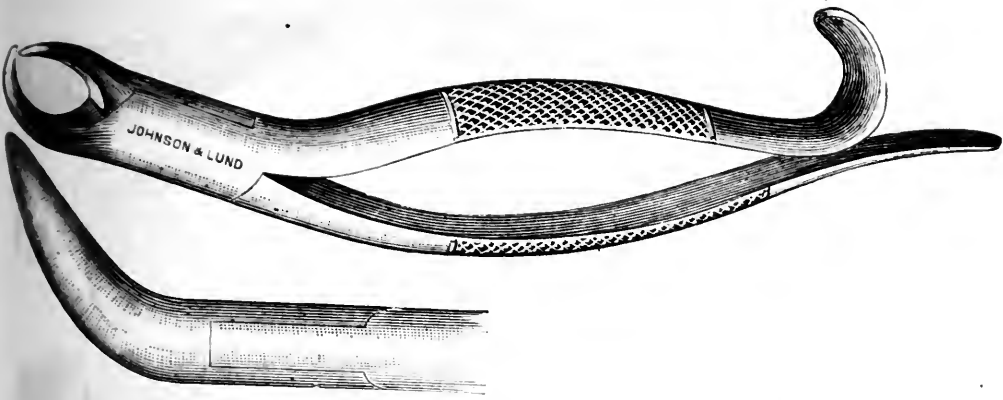
No. 8, Lower Wisdom, either side.—V. C. Pond's.



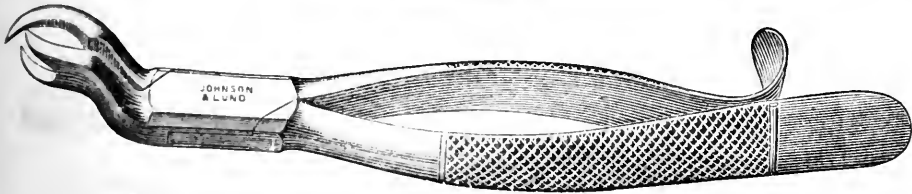
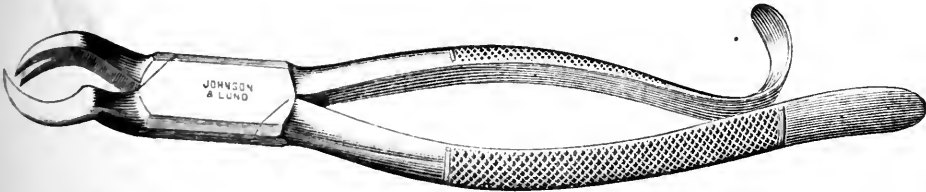
No. 9, Lower Root.—V. C. Pond's.



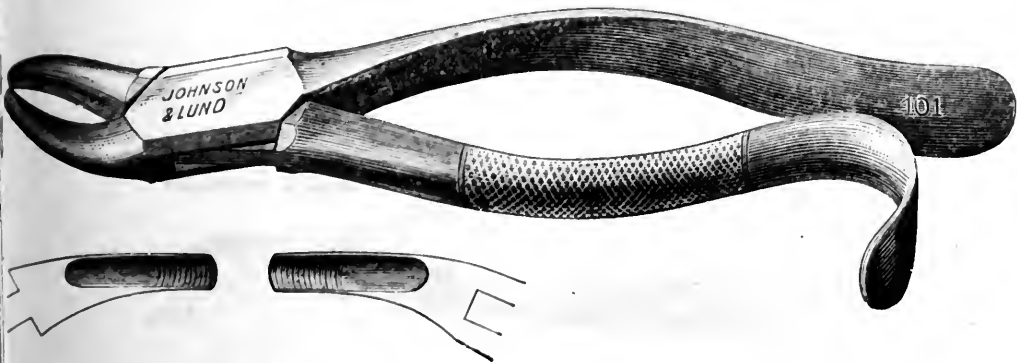
No. 10, Lower Incisor, Cuspid and Bicuspid.—V. C. Pond's.



No. 111, Lower Molar, Cow Horn, either side.—V. C. Pond's.

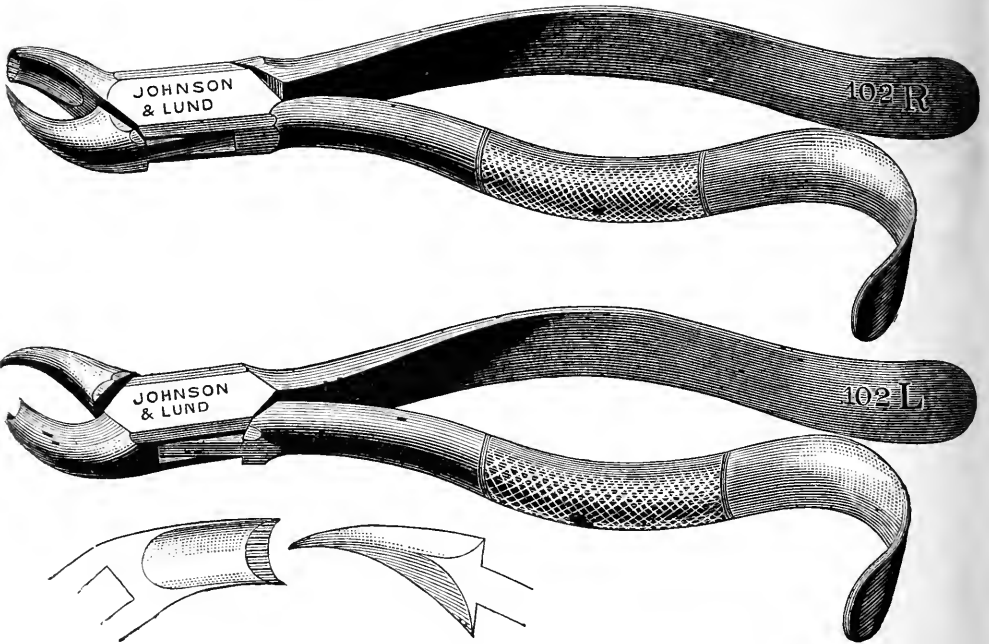


No. 101 1/2, Right and Left, Triple-Pronged Cow Horn, for Difficult Molars.
—Dr. Weirich's.

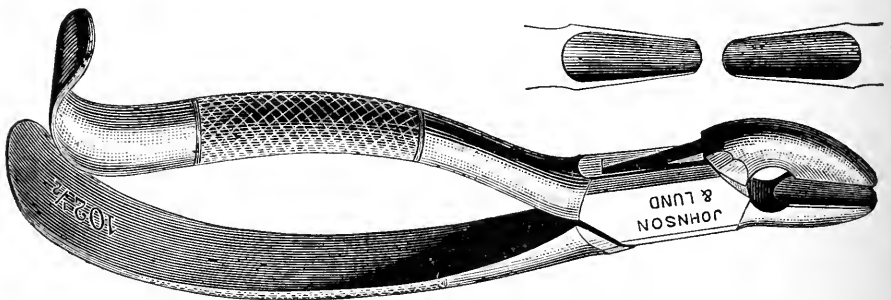


No. 101, Universal.—Dr. Weirich's

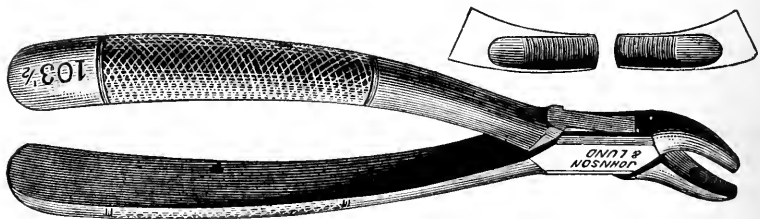
Price, - - - - - \$2.25 each.



No. 102, Right and Left Upper Molar, Cow Horn.—Dr. Weirich's.



No. 203½, Incisors & Bicuspid.



No. 103½, Universal Children's and general Root Forcep.

Price, - - - - - \$2.25 each.

THE

Dental Office and Laboratory.

THIRD SERIES.

VOL. II.

PHILADELPHIA, JANUARY, 1888.

No. 1.

A CASE OF IRREGULARITY.

BY THEODORE F. CHUPEIN, D. D. L.

Mr. E. R. applied to us to have the left upper cuspid ; which closed inside of the lower teeth, brought outward and backward, and the left upper lateral incisors rotated into position. The patient was about 19 or 20 years of age and very anxious to have the deformity corrected, so that we were materially seconded in our efforts. The case was not one that offered very serious impediments in the ordinary procedure of regulating cases, only excepting the fact that the bones were very dense, and, as a consequence, the teeth very difficult to move. Fig. 1 represents the condition of the teeth when we began operations.

Our first procedure was to extract the left upper 1st bicuspid. A vulcanite plate was then made covering the roof of the mouth as also the two forward molar teeth, so that the front teeth would be kept apart and thereby offer no impediment to the outward forcing of the ingrowing cuspid. A heavy piano wire spring was vulcanized on the palatal surface of this plate so that its end would exert pressure,

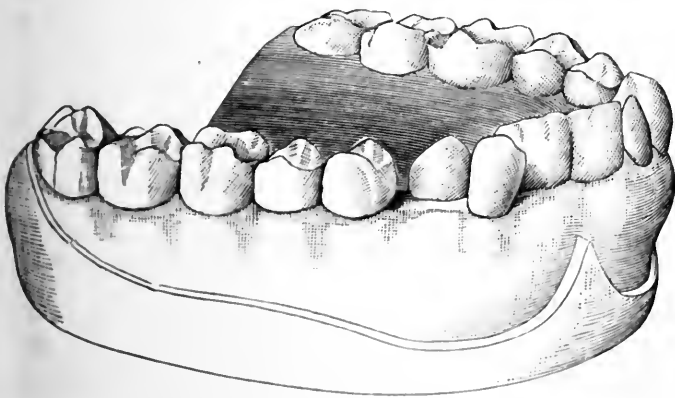


Fig. 1.

in the proper direction, on the irregular cuspid, to force it backward into the space recently occupied by the 1st bicuspid. But although this appliance was kept in place *four weeks* with a weekly ending of the spring so as to make it exert increased pressure; at the

expiration of that time the cuspid had not budged from its position in the slightest. We therefore changed our mode of operations.

Another plate was constructed just like the first. On the part which covered the left upper molars, a *threaded nut* was vulcanized into the plate, in position about the middle of the first molar on its buccal surface. A piece of small thin gold wire was hammered flat. A *free nut* was soldered to one end of this wire, which was to lie opposite to the threaded nut on the cheek surface, while the other end of the wire was vulcanized into the plate on its palatine surface. A bolt was passed through the *free nut* and the end caught into the *threaded nut*, and the appliance put in position, allowing the thin flattened wire to pass over, between the cuspid and lateral incisors. The patient was provided with a key which fitted the head of the bolt, and instructed how to tighten it, so as to exert pressure, as also how to unscrew it, that he might remove it for the purpose of cleansing it, as well as his teeth, after eating.

Fig. 2 illustrates the appliance just described.

After *one week's* wear of the above appliance the tooth (a very stubborn eye tooth) had visibly moved, and after a traction of *two weeks* more it occupied a position about half the distance it was requisite to draw it. But while it had moved backward, it still con-

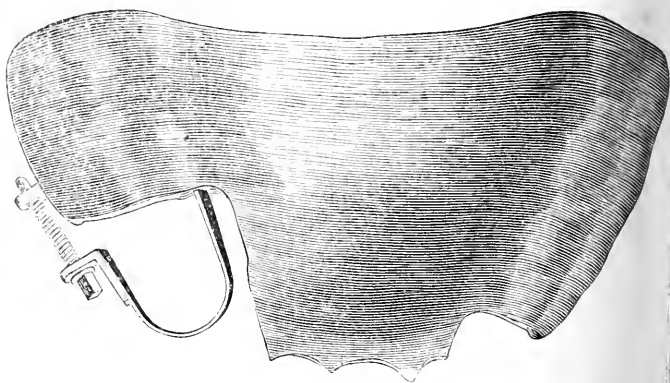


Fig 2.

tinued behind the lower teeth when the jaws were closed. It became necessary, therefore, while drawing it backward to give it also an outward tendency. For this purpose we constructed another plate on the same plan as the others. The *threaded nut*, as before, was secured on the outside, as in Fig. 2, but the end of the small flattened wire instead of being fastened on the palatine surface of the plate was secured to that part which passed over the molars, at the buccal surface. Fig. 3 illustrates this appliance. It will be seen that on applying force to the bolt the disposition of the force is both to draw the tooth backward as well as outward.

In about *two weeks* after this appliance was put on, the cuspid was drawn backward and outward sufficiently to permit the teeth to occlude properly; the cuspid occupying the position formerly occupied by the extracted 1st bicuspid. It remained now to complete the case, to draw the lapping lateral incisor

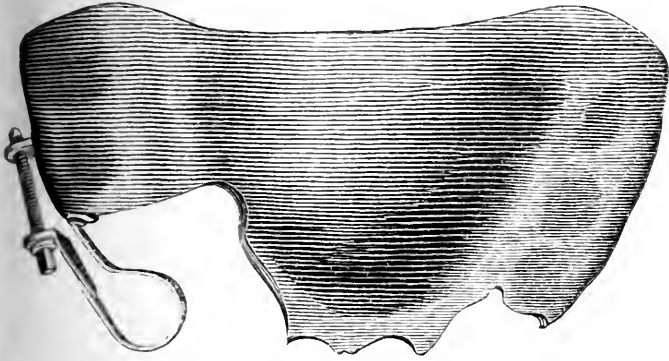


Fig. 3.

backward into the space left by the re-
ceded cuspid, as al-
so to rotate it. To
draw this tooth back
we constructed an
appliance similar to
the one shown at Fig.
2, only with a longer
strap-band, that it
might reach forward

and pass around the lateral. In *one week* more we had drawn this tooth back sufficiently to commence rotating it.

To accomplish this we burnished to the tooth on the model a band of thin platinum plate, and stiffened the same by melting small pieces of plate on to it. It may be well to state, in doing this, that the inner surface of this platinum band should be carefully coated with whiting to prevent the melted gold from flowing on the inside, thereby destroying its fit; or, of investing it with plaster and sand for the same object. The band being fitted and stiffened as described, a small extension of stiff plate was soldered to it on its labial surface, and this extension provided with a little socket, intended to hold the end of a spring which was to exert pressure in rotating the tooth. This will be better understood in studying the action of the spring on the band in Fig. 5. The band with its extension being made, the rubber dam was applied over the left central and lateral incisors, as well as over the cuspid. The left lateral—the tooth to be rotated—was wiped perfectly dry and rubbed well with dry pumice stone on a soft stick so as to remove all accumulation from the tooth, and then wiped clean. Phosphate of zinc was then mixed thin and the inner surface of the band coated with it, a little of the same cement was coated over the tooth and the band applied. When the cement had set hard, all the surplus was scraped and cleaned away from the tooth, and the rubber dam cut away from the teeth to which it had been applied. Fig. 4 represents the tooth to which the band has been attached.

An appliance was made similar to Fig 2, with a short strap-band to hold the cuspid in its new position, while a piano wire spring was vulcanized into the right buccal extension of the plate, running forward in front of the teeth, so that its end (which was provided with a piece of gold tube soft-soldered to it) could be placed in the socket, in the extension fastened to the band around the lateral incisor, thereby exerting pressure to rotate this tooth.

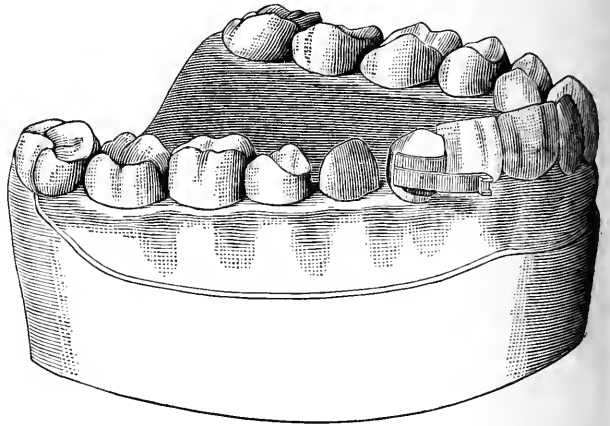


Fig 4.

Fig. 5 illustrates this appliance and shows its manner of working. We may here say that the little piece of gold tube, soft-soldered to

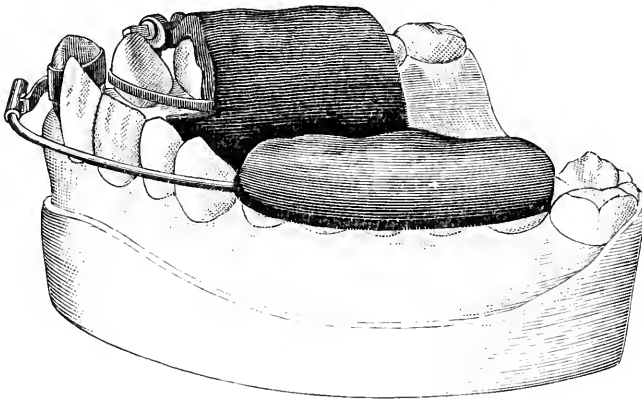


Fig. 5.

the end of the spring was not at all necessary to the appliance, but having unfortunately cut the spring too short we had to lengthen it by this addition.

In about *two weeks* the case was completed. A stay plate was made like an ordinary partial plate

covering the roof of the mouth, but not covering the masticating surfaces of the molars. This plate was provided with a little hook that passed through between the left central and lateral incisors, bending around and fitting close to the labial surface of this tooth so as to hold it in position, while a simple piece of plate, passed forward between the lateral incisor and cuspid, to prevent this latter tooth from working forward on to the lateral. Both the hook and the piece of plate were vulcanized into this retaining plate. This, as well as all the appliances made for this case, were removable for the purpose of cleanliness. The patient was directed to wear the retaining plate *at least one year*, to prevent the lateral incisor *particularly* from turn-

ing back into its old position. There was not so much fear for the cuspid, for as this tooth was now outside the lower teeth it could not get back to its old place. The retaining plate gave no discomfort to the patient as it was made quite thin, was held firmly in position by the regular central air chamber and in no manner interfered either with mastication or enunciation.

An illustration of the stay plate cannot be given, as it is in possession of the patient; but its construction was so simple that we do not doubt it will be readily understood from the description given. We regret too that, having been very busy at the time of its insertion, we were not able to take an impression and make a model of the mouth to show the case in its improved condition; and as the patient removed from Philadelphia shortly after its completion, we were unable to obtain a model of the teeth since. It occupied us about *three months* to correct the mal position of these two teeth. It is needless to say that the band which was cemented to the lateral incisor was cut away from the tooth, by dividing it with a separating file, the cement holding it so firmly that it was impossible to remove it otherwise.

THE PRACTICAL PLACE.

ALUMINIUM. By Geo. H. Swift. The early use of aluminium was not satisfactory, as the metal was impure, owing to the presence of iron, and it soon succumbed to the fluids of the mouth. This was more generally true of cast plates, which were not only more difficult to make, but were not as good. The metal is not very easy to cast, as it does not flow freely like other metals, and the contraction is considerable, causing cracked blocks. When made from rolled plate and pure metal, aluminium for upper cases has proved very satisfactory in my hands, and, not being very expensive is a recommendation, as it is a metal, and is thus better than rubber and less in cost than gold. It is very light and strong, perfectly tasteless and odorless, and as healthy to the gums as gold or platina. The teeth are best attached with rubber.

CEMENT FOR GLASSWARE WHICH WILL STAND HOT WATER.—Glue to which bi-chromate of potash has been added, and which has afterward been exposed to strong sunlight, becomes insoluble. The proportions are not very well ascertained, but about 1 part of the bi-chromate, dissolved in water, and added to a solution of 6 parts of solid glue, answers very well.—*Scientific American*.

A SUBSTANCE resembling ivory, of creamy whiteness and great hardness, is made from good potatoes washed in diluted sulphuric acid, then boiled in the same solution until they become solid and dense. They are then washed free from the acid and slowly dried. This ivory can be dyed and turned and made useful in many ways.—*Scientific American*.

GOLD will only melt at a comparatively high temperature, as we all know, but what is not generally known, the *Jewelers' Journal* says, is that if two per cent. of silica be added to the gold, it can be melted over the flame of a common candle.

From the same source the reader may learn that a pretty alloy, said to resemble gold exactly, can be made with 16 parts copper, 1 of zinc, and 7 of platinum. The copper and platinum are covered first with borax and then with powdered charcoal and melted, then the zinc added, and the alloy thus produced is exceedingly malleable, and can be drawn into the finest wire, while it never tarnishes.

SIMPLE METHOD OF ARTIFICIAL RESPIRATION.—In the *Brit. Med. Jour.* (*London Med. Record*), Mr. J. A. Francis describes a simple method of artificial respiration which, he alleges, combines all the advantages of the Marshall Hall, Sylvester, and Howard methods, without any of their disadvantages. The plan is as follows:

The body of the patient is laid on the back, with clothes loosened, and the mouth and nose wiped. Two bystanders pass their right hands under the body at the level of the waist, and grasp each other's hands, then raise the body until the tips of the fingers and the toes of the subject alone touch the ground; count fifteen rapidly; then lower the body flat to the ground, and press the elbows to the sides hard; count fifteen again; then raise the body again for the same length of time; and so on, alternately raising and lowering. The head, arms, and legs are to be allowed to dangle down quite freely when the body is raised. The author alleges that this method is most successful, and it is so simple that any one can perform it without any teaching.—*Scientific American*.

A NEW FUSIBLE ALLOY.—*Nature* gives the formula of a new alloy which is specially adapted to many important uses in the arts. It melts at the low temperature of 160° F., the temperature of moderately hot water, and considerably below that at which the magic spoons of long ago melted in a cup of tea. Its composition is: Bismuth, 48; cadmium, 13; lead, 19; tin, 20. This new alloy will withstand quite a severe pressure.

TO MIX PLASTER.—Always add the plaster (a little at a time, stirring constantly,) to the water, not the water to the plaster. After getting the impression (always taken in plaster), give it a coat of shellac varnish, not too thin, and while it is drying run a ring of sheet wax around it, an inch or so deep. After the varnish is perfectly dry, instead of oiling, sprinkle powdered French chalk freely over the impression, then with a soft brush—I use a badger's hair shaving brush—rub every part of the impression thoroughly, finally shaking out the surplus; then mix the plaster pretty thin, and pour, tapping the cup gently until the plaster commences to set. After it has hardened and you have cut away the impression, you will find the cast to have a perfectly glazed surface, free from air bubbles. Now proceed as usual and when the wax is removed dust the cast with chalk, the same as you did the impression. You will find after the plate is vulcanized, all that will be necessary to have a beautifully polished palatine surface, will be a short use of the brush wheel.—*Ohio Journal of Dental Science.*

NUTRITIVE VALUE OF DIFFERENT FOODS.—Professor Voit has lately investigated the real value of different kinds of food, and gives the following results :

							Taken up.	Excreted.
Meat,	-	-	-	-	-	-	96.7	3.3
Rice,	-	-	-	-	-	-	96.1	3.9
Eggs,	-	-	-	-	-	-	94.8	5.2
Wheat Bread,	-	-	-	-	-	-	94.4	5.6
Indian Corn,	-	-	-	-	-	-	93.3	6.7
Potatoes,	-	-	-	-	-	-	90.7	9.3
Milk,	-	-	-	-	-	-	88.7	11.1
Rye Bread,	-	-	-	-	-	-	88.5	11.5

Meat, rice and eggs are not only directly the most valuable food, but also indirectly, as they are most easily digested.

KALIDONT.—G., Brooklyn.—We are unable to give you the formula for this preparation. As a reply to your alternative request for a recipe for something for the same purpose, we refer you to another note in this number concerning “sozodont.” Where deterrent effect is not so much wanted as “sweetening” or perfuming power, the following will be found highly satisfactory. It is an imitation of the French

EAU DE BOTOT :

Oil of Peppermint,	-	-	-	30 min.
Oil of Spearmint,	-	-	-	15 min.
Oil of Cloves,	-	-	-	5 min.
Oil of Red Cedar Wood,	-	-	-	60 min.
Tincture of Myrrh,	-	-	-	1 fl. oz.
Alcohol,	-	-	-	1 pint.

Compound tincture of cochineal, sufficient to color.

Care must be taken not to confound the oil of red cedar wood with the common oil of cedar usually found in the market. The latter has a terebinthate odor; the former smells like the cedar wood often used as a casing for lead pencils. It may easily be procured from any dealer in perfumers' materials.

As a mouth perfume this is very fine and especially valuable in overcoming the odor of tobacco. Its use may advantageously be preceded by a brushing with soap, which is one of the best cleansing agents.

DISK CUTTER.—I take a No. 10 ($\frac{3}{4}$ in.) gun wad punch and drill a hole up into the center of the shank. In this hole is driven a steel pin, the free extremity sharpened and on a level with the cutting edge of the punch. From a sheet of sand or emery paper, shellacked on the back, can be punched dozens of disks, perforated in the centre ready for mounting.—F. L. D., in *Archives of Dentistry*.

TO REMOVE STAINS FROM TEETH.—Peroxide of hydrogen made into a solution of the strength of five per cent., mixed with powdered pumice and well rubbed over the teeth removes most stains. The teeth should afterward be well cleansed with tepid water, but the application given above is harmless.—*British Journal Dental Science*.

CELLULOID CEMENT.—One part shellac dissolved in one part spirits of camphor and 3 parts of 90 per cent. alcohol. The cement should be applied warm, and the broken parts securely held together until the solvent has entirely evaporated.—*Scientific American*.

TO TEST THE VITALITY OF TOOTH PULP.—The preliminary isolation and drying of the suspected tooth and the immediately adjoining ones is the same as by the old method, although the rubber dam is not so essential. The tooth is then tested by applying to it a piece of gutta percha which has been heated over a flame. It takes hold and transmits its heat at once and there is an almost immediate response if the pulp is living. If there is no response, it may, without being again heated, be applied to one of the adjoining teeth, with a known living pulp, and the comparison noted. The old method of testing with a heated steel instrument is terrifying to a nervous patient and the response if the pulp be alive is often tardy in coming or may be entirely absent. Apprehensive patients under the influence of fears or imaginings will frequently, when a heated instrument is applied, mislead the operator by declaring that a tooth is sensitive when you know it to be pulpless.—*Dental Review*.

FILLING PULPLESS TEETH.—Teeth with dead pulps may be safely treated and filled at one sitting, provided there is not too much inflammation. If there is a fistula, treat as follows: Wash out all pus and remains of the pulp with peroxide of hydrogen, forcing the peroxide through the fistula, and keep this up until it ceases to bubble; then wash out with bichloride of mercury, 1 gr. to the ounce of water, thoroughly dry by washing with alcohol, evaporate this with hot air, finally force carbolic acid through the tooth and fistula, wipe out all the carbolic acid from the tooth and root canal; now the root canal is ready to be filled, no further treatment being required. If there is no fistula, treat as above, being careful not to force any septic matter through the apical foramen, and fill at once, if there is no inflammation to prevent. If there is inflammation, paint the gums with chloroform, tincture of aconite and tincture of iodine, equal parts, and direct the patient to return in three or four days, when the chances are that the tooth may be filled. Should any trouble follow the above treatment, make an opening through the gum to the apex of the root and treat through that.—J. G. HARPER, in *Items of Interest*.

BINIODE OF MERCURY AS AN ANTISEPTIC.—Dr. P. K. K. Bolshesolsky, of St. Petersburg (*Vratch*, No. xi, 1887, p. 220) from numerous experiments made by himself and Professor A. P. Dobroslavin's laboratory, concludes that biniodide of mercury is a more powerful and less poisonous antiseptic than corrosive sublimate. Thus he fully confirms the observations of Bernhardt. A solution of one in 4,000 destroys putrefaction microbes more completely than a sublimate solution of 1 in 2,000. The biniodide dissolved in a solution of iodide of potassium was recently tried, with apparently good results, in three cases of laparotomy, under Professor A. I. Krassowski. For washing the floor, a solution of 1 in 4,000 was employed; for disinfecting the hands, 1 in 2,000 and 3,000.—*Brit. Med. Journal*.

METHODS OF USING IODOFORM.—Eighty parts iodoform, fifteen parts oil of cinnamon, and five parts finely powdered ground coffee, packed into a foul root, will disinfect it, and also prove a very agreeable dressing.

PREPARATION FOR THE DESTRUCTION OF PULPS.—

R. Caustic potash,	gr. xij
Arsenious acid,	gr. x
Aquæ puræ, q. s. to make paste; add	
Cocaine,	gr. x.

M. Sig.—Use same as arsenious acid.

An exchange gives the above as something worth knowing.

HOW TO KEEP THE SKIN SOFT.—A writer in the *Medical World* states that while he was a student at Jefferson he learned to use a lotion which has the curious property of preserving the skin from the effects of cold, preventing chaps, and rendering the hands soft, white and smooth. One need not wear gloves in winter, if this be used constantly :

R.	Ol. Rosæ	-	-	-	-	gtt.xv
	Glycerini	-	-	-	-	3j
	Spirit. myrciæ	-	-	-	-	fʒiij
	Ol. cajeputi	-	-	-	-	gtt.xx

M. SIG.—To be used on the hands every night before going to bed, and in cold weather to be applied before going out into the open air, the hands being washed and dried.

A SIMPLE and quick way to make solid grinding surfaces for bridge or crown work, is as follows : Procure a natural tooth corresponding to the tooth to be made ; lay a piece of cuttle-fish bone on the bench soft side up, and then press the occluding surface of the natural tooth into the soft cuttle-fish bone ; on removing the tooth a perfect impression will be left in the soft bone. Now melt some scraps of gold and while fluid pour into the impression and press the gold while soft into place with a smooth flat instrument; the result will be a perfect copy of the natural tooth. This is the way jewelers cast gold ornaments.—E. N. HAMILTON, Ontario, Cal., in *Items of Interest*.

ALUMINUM-SILVER ALLOY.—Alloyed with a small per cent. of silver, aluminum loses much of its malleability, but with 5 per cent. of silver it can be worked well, and takes a more beautiful polish than the pure metal. With 3 per cent. of silver it is very suitable for philosophical instruments, being harder and whiter than the pure metal, and is not tarnished even by sulphureted hydrogen. With small amounts of silver, it appears very suitable for scale beams, and is now frequently used for this purpose. The alloy containing 5 per cent. of silver has often been suggested for coin of small denominations, as it is hard, bright and retains its luster in handling.—*Scientific American*.

A SIMPLE MATRIX.—I have some of the patented matrices but seldom use any of them, preferring a matrix made as follows : Take a very thin piece of sheet brass, steel or iron ; the thin sheet iron that is used in the mailing cases that instruments come to us in answers very well. Cut out a piece of suitable width and length, bend back upper corners and curve to fit the tooth, place between the teeth, make a feathered wedge of orange wood and push behind the matrix at

cervical margin; then take a pellet of base plate gutta-percha of suitable size, warm and pack into the spaces between the teeth so as to be securely held behind the reflexed corners; as soon as cold proceed with filling; when done remove with warm instrument. I find it simple, easily applied and quite efficient.—BY DR. J. S. ROUNCE, ELLSWORTH, WIS.

THE DIET OF STRONG MEN.—The Roman soldiers, who built such wonderful roads, and carried a weight of armor and luggage that would crush the average farm hand, lived on coarse brown bread and sour wine. They were temperate in diet, and regular and constant in exercise. The Spanish peasant works every day and dances half the night, yet eats only his black bread, onion and watermelon. The Smyrna porter eats only a little fruit and some olives, yet he walks off with his load of a hundred pounds. The coolie, fed on rice, is more active and can endure more than the negro fed on fat meat. The heavy work of the world is not done by men who eat the greatest quantity. Moderation in diet seems to be the prerequisite of endurance.—*Selected.*

INSTRUCTION FOR PATIENTS.—It is important to instruct our patients in regard to their teeth, but they will not read pamphlets or long papers. I keep a supply of something like the following in leaflets for distribution among my patients, which I think has benefited them as well as myself:

TO MY PATIENTS.—Teeth that are filled will decay again if exposed to the same causes that produced the original decay.

Your teeth are filled with an indestructible material, and decay can be prevented by careful watching and cleansing.

Have your teeth examined often. A small filling is less expensive than a large one, less painful to insert, and there is a better chance to save the tooth.

Cleanse the teeth every time food or anything else injurious to the teeth is taken into the mouth. Many medicines are very injurious to the teeth; therefore it is well to cleanse them after they have been in contact with medicines.

Use prepared chalk and castile soap with tooth brush and picks to cleanse the teeth, and to correct acid conditions, bearing in mind that absolute cleanliness is of more value than the skill of the dentist.

If you neglect your teeth, the fillings are apt to fail, your dentist is unjustly blamed, and your most intimate friend will not tell you that you have a bad breath.

MORGAN ADAMS.

INSTRUMENT FOR ENLARGING THE HOLES IN ARTIFICIAL TEETH.—MR. W. H. Rollins says: I frequently find it convenient to alter the shape of the holes in pivot and other porcelain teeth. At first I used a piece

of copper wire, with emery powder, getting the idea from the glass-cutters. Now, however, I find that the time required can be reduced to one-third by using a piece of hardened steel of an oval, square, or half-round shape, made to revolve rapidly in an office lathe, and kept covered with coarse corundum moistened with glycerine. To show how rapidly this will cut, it is only necessary to say that a common Bonwill crown can have the hole enlarged enough to admit of two pins as for a bicuspid in ten minutes.

A GOOD AMALGAM FILLING.

By J. R. CALLAHAN, D.D.S., HILLSBORO, OHIO.

We do not propose to discuss the properties of amalgam as a filling material, but to give a method whereby better results may be obtained than by methods in general use. It is well known to all dentists that an immense quantity of amalgam is used every day in the filling of teeth. This being the case, it behooves us as a profession to endeavor to study and adopt the best methods of inserting the filling material. The following, of all other methods, has proved the most satisfactory to the writer. We will suppose a proximal cavity between any of the molar teeth, to be properly prepared, rubber dam adjusted, matrix in position, tooth dry and in good shape. Now mix a proper quantity of almost any of the leading brands of alloy. Mix moderately stiff, insert enough amalgam to fill the cavity about one-third full, tap this to its place, then put in the cavity a strip of Robinson's fibrous and textile filling material, from one-half to one inch in length by one-eighth to one-fourth inch in width, depending on the size of the cavity; tap this down on the amalgam. Most likely the mercury from the alloy will take this all up; if so, add another piece of fibrous material, this time using a steel Herbst rotary burnisher in the engine, using speed and pressure. Use fibrous material in this manner till within about $\frac{1}{16}$ or $\frac{1}{32}$ of an inch of the grinding surface, when it will be best to fill flush to the surface with amalgam. Do this for the purpose of getting a hard grinding surface. After filling flush to the surface with alloy, lay on strips of fibrous material and rub with burnisher; keep adding material and burnishing until you have taken all the mercury from the filling that it is possible to get. Then finish carefully. In removing the matrix you will find the filling adhering to it, unless you have the precaution to put a thin coat of oil on the side of the matrix next to the cavity. If the above method is carried out, you will have an amalgam filling that under ordinary circumstances will not tarnish, and will have the minimum amount of shrinkage.

NINTH INTERNATIONAL MEDICAL CONGRESS,

(Held at Washington, D. C., September 5, 6, 7, 8, 9, and 10th, 1887).

This Congress was convened in the city of Washington, on Monday, Sept. 5th, and continued until the 10th, inclusive. It was opened by President Cleveland in Albaugh's Opera House.

The section on Dental and Oral Surgery was organized by the president of this department, Professor J. Taft of Cincinnati, who welcomed those present. His remarks were followed by an address of welcome by Dr. W. H. H. Thackston of Virginia, after which President Taft delivered his address in which he reviewed the progress of dentistry in the last fifty years, and concluded by saying that although the past record was an excellent one, yet the goal is not yet reached. He urged the profession, through those present, to work in all earnest for a yet higher standard.

A rather amusing incident occurred at the conclusion of the President's address, by the presentation of a gavel, by the State Dental Society of Minnesota. This was in the form of an immense molar tooth which was made of white cement, with black rubber handle banded with pure gold; the three materials being emblematic. The Rubber representing the elasticity of thought; the Gold the purity of motives; the Cement ties which bind all members of the profession together.

The presentation elicited great applause.

Dr. R. I. Parre of Cincinnati, O., read a paper on "Chronic Pyæmia from Dental Origin," which was discussed by Drs. Lydston of Chicago, Ill.; Walker of London, England; Barrett of Buffalo, N. Y.; W. I. Younger of San Francisco, Cal.; and Chance of Oregon.

The translation of a paper by Dr. E. Brasseur, of Paris, France, was read by the secretary, entitled "The use of Air in Dental Therapeutics." The paper eliminated views on the value of medicinal vapors and hot air as obtundents to sensitive dentine.

Dr. Wm. Carr, of New York, gave a clinic on the "Treatment of fractures of the maxillæ with] modified interdental splint." He illustrated how to apply a four-tail bandage, which should be retained from three to five days. He used peroxide of hydrogen for disinfecting, and said in ordinary cases the splint should be retained three or four weeks, according to the physical condition of the patient.

Dr. I. E. Cravens of Indianapolis, Ind., read a paper on "The management of pulpless teeth," the treatment suggested was to thoroughly cleanse the pulp-canal, and at once to hermetically seal it with tin foil.

The paper was discussed by Drs. Fillibrown of Portland, Me.; Harland of Chicago, Ill.; and Barrett of Buffalo, N. Y. Dr. Harland objected to the views expressed by the essayist, and Dr. Barrett protested against the acceptance of the treatment advanced as reflecting on the intelligence of American Dentists.

Dr. T. E. Weeks of Minneapolis, Minn., read a paper on "Matrices as adjuncts in filling teeth." He reviewed the different appliances for simplifying what would be otherwise a laborious operation. He said "a perfect matrix should be simple in construction, cheap, easily adapted, and not too stiff, so that when applied, it will yield just enough to allow sufficient gold to pass beyond the walls of the cavity for a good finish."

Dr. Guilford, of Philadelphia, Pa., endorsed the sentiment expressed in the paper.

Dr. Geo. H. Winkler, of Augusta, Georgia, read a paper on "Soft gold foil." He claimed superior advantages for it, as more preservative, better adaptability, and the saving of time and strain to both patient and operator.

Dr. Morgan said that much could be done with cohesive gold that never could be done with soft foil, and in view of this instance how the profession had largely abandoned soft gold, regarding cohesive gold as the best.

Dr. Storey, of Texas, said he never saw a tooth filled with soft foil, that could not have been better done with cohesive gold.

Dr. Beach, of Tennessee, said that both kinds of gold should be used according to the case presented.

Dr. Fletcher, of Cincinnati, O., read a paper on "Protective dentine" illustrated by stereopticon. The paper was listened to with great interest. The views on the screen showed the different kinds of protective dentine, and the essayist gave his views of how these different effects on the part of nature to protect herself are brought about.

CLINICS.

About thirty gentlemen gave clinics in filling teeth with gold, pivoting teeth, constructing artificial dentures, and treating surgically diseased conditions of the gums. It would require too much space to enumerate all the operations performed, or all the gentlemen who acquitted themselves in such a creditable manner.

The section was honored by a visit from the President of the Congress, Dr. N. S. Davis. In introducing him, President J. Taft re-

counted the efforts that had been put forth by Dr. Davis to secure recognition to the Dental Section. To him more than to any other man in the medical profession is due the credit for having removed the obstructions in the way of the dental specialty.

Dr. Davis replied: Twenty-two years ago I had the pleasure of entertaining the members of the American Dental Association, then assembled at Chicago, at my house. On that occasion I expressed the hope that some day, in the near future, we might meet on equal grounds. My hopes of that day are realized to-day. At the last meeting of the American Medical Association, when the question was brought up to admit dentists holding their degree from a recognized institution, it met with no opposition. The action of that body has forever removed the obstacle which had been in your way, and you are now on an equal footing with your medical brethren. He congratulated the members for the interest they took in the advancement of the healing art, and closed by warning them not to fall into "schools," but to meet every one on the broad field of science.

The President congratulated the members on the interest they had shown throughout the session, and hoped great good might come from this Congress, both to the profession and their patients.

A vote of thanks was voted to President N. S. Davis for the exertion he put forth in behalf of the dental section.

Also a vote of thanks was offered to President J. Taft and the Executive Committee.

SELECTED ARTICLES.

THE PHYSICAL PROPERTIES OF VULCANITE.

BY GEORGE B. SNOW, D. D. S., BUFFALO, N. Y.

[Concluded.]

It has been heretofore shown that when a cubical mass of rubber is vulcanized, its sides, instead of remaining flat, become more or less concave; also, that by vulcanizing, the specific gravity of rubber is increased. In an instance given, the increase was from 1.333 to 1.974; showing a decrease in bulk of about five per cent. This decrease in bulk will hereinafter be spoken of as "shrinkage," to distinguish it from the contraction which takes place in rubber, as in other substances, from cooling; and which, rubber, takes place to an extent over six times as great as in iron. '

In dental plates, shrinkage is apparent at times by the drawing away of the rubber from the teeth. It is more often noticeable at the lingual sides of the bicuspid and molars, and may occur when either plain or gum teeth are used. When section teeth are so set as to leave a considerable space between them and the alveolar ridge to be filled with rubber, the shrinkage forms a pocket under the teeth, which becomes a receptacle for the *debris* of food when the plate is worn, its existence not being manifest until the teeth are removed from the plate.

It is a question if shrinkage cannot also occur so as to draw the rubber away from the alveolar ridge, thus relieving the pressure thereupon at certain points, and injuring the adaptation of the plate by causing it to rock. While this matter has not been studied sufficiently to warrant a positive expression of opinion upon it, it may be safely said that the best fitting and most satisfactory vulcanite plates are those in which the material is of nearly an equal thickness throughout, having the teeth set closely to the alveolar ridge; a condition of things in which shrinkage from vulcanization would be scarcely, if at all, perceptible.

Shrinkage can be diminished in amount by the use of fragments of already vulcanized rubber in packing the plate, in the manner detailed in THE DENTAL ADVERTISER for last April, page 45; or, in some instances it may be advisable to prepare a mass of metal, say block tin, of the proper form to replace the greater part of the thick mass of rubber in the mould, leaving only a thin layer of it on the surfaces.

The effects of shrinkage are, to say the least, obscure; and it is probably in but few cases that they are the cause of any serious annoyance. On the other hand, the contraction of rubber in cooling is responsible for a very large percentage of the misfits of rubber plates. It is not great enough of itself to cause much annoyance, as when plain teeth are used its effects are scarcely manifest, if at all; but with section teeth its effects are so intensified that it is safe to say that nine out of every ten artificial dentures in which they are employed are misfits; requiring more or less correction before they can be worn with comfort.

The plate is moulded and the rubber hardened at a temperature of from 300° to 360°. As it cools, it contracts at a much more rapid rate than the porcelain of which the sections are composed. The teeth form an arch, the ends of the sections being in contact. Inside this arch is another, made up of the ridge of rubber in which the pins of the teeth are imbedded, and this inner arch, by its contraction, will

tend to make the outer one smaller. The heels of the plate are thus drawn together, and that, too, to an amount easily measured. The palatal portion, if it be an upper plate, will be raised, and the plate will be found to bear too hard upon the center of the rear portion of the palate, and to rock. If it be worn in this condition, the palate will be chafed, and the result will be a sore mouth.

To demonstrate the amount of contraction by cooling, let a deep mark be made upon either heel of the trial plate when it is waxed up and ready for the flask; deep enough to be easily seen upon the plate when vulcanized. If the distance between the marks be accurately measured by a pair of dividers, both on the trial plate and afterwards upon the vulcanized one, the distance between the marks upon the latter will be found to be considerably the less; generally about a twenty-fourth of an inch. This is not so much but what the plate will usually pass over the condyles, the ill effects of the change being mostly manifested in the rocking of the plate by the elevation of its palatal portion.

Careful observation will show this state of affairs to be the rule, rather than the exception, and it now remains to point out the way in which these evil results may be remedied. A rough-and-ready method of correcting the difficulty, is to warm the back edge of the palatal portion of the plate with a spirit lamp, and force it down with the thumb. Greater accuracy is insured by running a small plaster cast, covering only the palatal side of the plate, not extending farther than the alveolar ridge. A strip of paper about half an inch wide is now folded back and forth, the first fold being very narrow, each one increasing in width, until the combined thickness of the folds is equal to the amount of change desired in the plate. The paper is then placed upon the back edge of the cast, the rear part of the palatal portion of the plate is warmed enough to soften it, and then forced into close contact with the cast and paper. When the plate has cooled, a space will be found between it and the cast, equal to the thickness of the folded paper, and the pressure upon the palate will be relieved. If too much change should be made, and the plate should leak at its back edge, one or two folds of the paper can be torn off and the plate refitted.

Contraction is thus partially remedied, and a fairly good fit obtained with a new plate; but when it becomes necessary to revulcanize it, a second contraction takes place, its heels are drawn still further together, and the fit of the plate is perceptibly worse than before the second vulcanization.

The difficulty may be overcome in great measure by *stretching* the plate to its original width. This is done by heating a spot in the plate immediately behind the central incisors as hot as is practicable without injuring the rubber. Before beginning, marks should be made upon either side of the plate immediately behind the second molars, and an accurate measurement made, with dividers, of the distance between them. The plate should then be stretched until the distance between the marks is increased from a sixteenth to a twenty-fourth of an inch, the distance depending upon whether the effects of one or two vulcanizations are to be counteracted. The heat should be applied to both sides of the plate, over a space as large as the thumb nail, by short, quick puffs of the blow-pipe, and continued until the rubber is warmed and softened clear through; then, taking each back corner of the plate by the thumb and finger, it is forcibly spread, and at once passed under a stream of cold water while under tension. Possibly the back edge may not now touch the palate; in which case it can be heated and forced upwards a trifle.

By warming only a very small portion of the plate, there is no risk of changing its general shape, so as to destroy its fit; while by cooling it, with the small space which has been heated, under tension, this part alone is expanded, and acts in the same manner as driving a key in the center of the arch. If the expansion is overdone, a slight re-heating behind the incisors will allow it to contract.—*Dental Advertiser*.

ARSENIC—HOW TO APPLY IT.

The usual methods of applying arsenic are as a paste and a powder. The paste consists of arsenic, creosote and morphine. The powder is the commercial arsenic. The paste is the most popular form, and I am at a loss to determine why, unless it is the too common reason that because the bell-wether jumped the fence the other sheep followed. It is sticky and requires considerable dexterity to place accurately where desired. The morphine I believe to be an entirely useless ingredient, because the arsenic and creosote act first, closing the absorbents so effectually that no morphine can be taken up. What surgeon desirous of introducing a remedy by absorption would first cauterize the surface? The creosote acts as a pain obtunder, but is no more effective than oil of cloves and is much more unpleasant. I do not like creosote. In my hands it is not nearly so effective a pain obtunder as carbolic acid and is about on a par with the essential oils. I speak, of course, of pure wood creosote. The commercial article is fully half carbolic

acid, and is therefore just that much better than the pure article. A solution of carbolic acid in oil of cloves, or cinnamon, makes a very effective and not unpleasant remedy—it should be almost equal parts. If an application as mild as creosote is desired, I would prefer oil of cloves as being more acceptable and equally efficient. The profession has unfortunately fallen into the habit of creosoting everything in a way that is decidedly empirical. In using the paste a small portion is taken upon the point of an instrument or carried to the cavity upon a few fibers of cotton. The powder is used by moistening slightly a very small pellet of cotton in the obtunding solution, touching lightly to the dry arsenic, and placing in the cavity with pliers. There is usually enough arsenic adherent to the cork of the bottle for several applications. Only a very small portion of the drug is required (about one twentieth grain), but we use, as a matter of convenience simply, much more than is really necessary, and enough at times to be hurtful.

In regard to preparing a cavity for an arsenical application, I should make it a rule never to give pain. We should be satisfied to syringe with lukewarm water and to lightly detach loose pieces of debris, leaving the excavating to be done when it can be done without pain. The walls of the cavity should never be broken down except when necessary to gain access.

Having now placed the arsenic in position, our next care is to keep it there. In a cavity with four walls, neither of which impinges upon the gum, this is a very simple matter, bearing in mind, however, that the material used as stopping must, while it keeps the medicine in the cavity, be sufficiently porous to permit the escape of gases formed by the decomposition of the pulp. This is essential because patients often fail to keep appointments, and we are obliged to guard against their negligence as well as against incidental danger. Periostitis from decomposing pulp is a serious complication to both patient and operator. There need be no effort made to keep the saliva out of the cavity; the arsenic is but sparingly soluble and its mechanical retention is all that is necessary. For this class of cavities a cotton plug is the most efficient means we have. It can be moistened with sandarach if desired, but I do not consider it necessary and rarely use it. All other cavities than these I have mentioned require greater care to properly retain the medicament. It will be readily recognized that if arsenic escapes from a cavity the margin of which impinges on the gum, death of tissue just in proportion to its invasion will follow, and to prevent this, especially in proximal cavities, is often very difficult. Adhering still to cotton as the best plug when applicable, it must be

accurately adjusted while the cavity is dry, and while still in this condition saturated with a solution of sandarach or shellac. If the walls of the cavity are so badly broken down as to make the retention of the plug unlikely, and ligatures cannot be used to bind it in place, we are obliged to resort to other means, and oxychloride of zinc, gutta percha, or zinc phosphate can be used. But it must be remembered that they lack the element of porosity and therefore need earlier removal. The two latter have another objectionable feature: it is exceedingly difficult to apply them without producing pressure on the pulp and pain as a concomitant. Any application that produces pressure upon the pulp as evidenced by pain, is faulty, and should be removed at once. Attention to this will save your patients nights of agony. The oxychloride acts very nicely in such cases, and can be made to adhere to an almost flat surface if dry. Its use occasions some pain (momentary) which can be decreased by mixing it pretty stiff.

It becomes occasionally necessary to destroy a pulp that is not exposed by the cavity; in such a case, make the application as usual, but allow it to remain only twenty-four hours, when the pulp can be approached with little or no pain and the arsenic applied directly.—MORSMAN, *Trans. Iowa State Dental Society*.

Legal Opinion Respecting Tooth Crown and Bridge Work Patents.

We have been handed the following circular by Dr. B. C. Nash, Secretary of First District Dental Society, of New York, with the request that we publish it:

NOVEMBER 1st, 1887.

A. L. NORTHPROP, D. D. S.

DEAR SIR:—In answer to your request on behalf of the First District Dental Society of New York, asking for our opinion as to the legal position of the dental profession, with regard to the crown and bridge patents of the "International Tooth Crown Company," in view of the recent decision of Judges Wallace and Shipman, in the Richmond and Gaylord suits, and advice as to relief from further claims made under the Low bridge patent, we have to say:

These suits involved the validity of the two patents to Cassius M. Richmond, Nos. 277,941 and 277,943, for "Tooth Crowns, etc.," the patent to Alvan S. Richmond, No. 277,933, for "bridge," all dated May 22, 1883, and the patent to James E. Low, for "method of supporting artificial teeth by bands cemented to permanent teeth," No. 238,940, dated March 15th, 1881.

The first two patents covered what is known as the "Richmond" and the "Sheffield" tooth crown in all its varieties. They were held invalid, and therefore you are at liberty to make such tooth crowns without being in any way liable to the International Tooth Crown Company.

The complainants have appealed this case to the United States Su-

preme Court, but we do not advise you that any different decision will probably result. The practical result is that the tooth crown is free.

The patent for the Richmond bridge was also held invalid, but the Low patent was declared to be good. This Low patent covers a bridge attached to continuous bands cemented to adjoining permanent teeth, "whereby said artificial teeth are supported to said permanent teeth without dependence on the gum beneath."

The Richmond patent is, as you will remember, for a bridge supported by caps, and the Court held that it was not invention for Richmond to support a bridge on caps, but it was invention for Low to support a bridge on bands, taking all the surrounding circumstances into consideration, and that as a cap was nothing but a band with a roof on it, the Richmond bridge infringed the Low patent.

The practical effect of this decision, if the complainant chooses to follow it up diligently, and unless some new evidence is found, will be to shut the profession out from inserting permanent bridges supported at one or more points by cemented caps or bands without dependence on the gum.

As the matter now stands, any dentist inserting a Richmond bridge (according to the decision) infringes the Low patent; and an injunction would doubtless now be granted by any Federal Judge on application, on the strength of that adjudication alone.

An appeal can be taken by the defendants to the Supreme Court, a year or so hence, after an accounting by them, and determining the amount of profits or damages the complainant is entitled to recover.

The way of relief is for all the dentists of the United States, who supported artificial teeth on a band or bar, surrounding and extending between permanent teeth prior to September, 1878, to send to us at 833 Broadway, New York City, or to No. 9 Law Chambers, New Haven, Connecticut, a truthful description of what he did, and for whom and where and when.

If such proof can be made strong and clear enough to satisfy the Court that what Low described was well known, and had been long practiced by dentists in the United States before Low claims to have done it, the present case might be opened for re-hearing on the newly discovered evidence—or the Courts might refuse to grant injunctions, upon the ground that the present decision would have been the other way if this evidence had been before it—at any rate, the question of the validity of the Low patent would be re-tried, if its owner ever had the temerity to sue a dentist whose mouth had not been closed by a license, in which he covenanted never to deny its validity.

Whether in a suit against such a license, the Courts would enjoin upon the *covenants*, under a patent declared void, either before or after the taking of the license, we can not say.

Your obedient servants,

(Signed,)

SOLOMON J. GORDON,

833 Broadway, New York City.

(Signed,)

JOHN K. BEECH,

9 Law Chambers, New Haven, Conn.

CURE OF ALVEOLAR ABSCESS BY GUTTA PERCHA.

DR. D. R. JENNINGS.

There can be no alveolar abscess unless there is absorption of the alveolus, and that this absorption makes a cavity which must be disposed of to effect a cure. The plan of procedure the writer recommends in such cases is: As soon as there is an abscess formed it will be found that the root of the tooth, after extraction, has become denuded of its periosteum where the sac is attached. The point is to get rid of the abscess and restore to a healthy condition.

The writer recommends the plan of filling the whole of the abscess cavity and root canal with a solution of gutta percha in chloroform. To make this, take a portion of gutta percha; cut into small pieces and put into a bottle containing chloroform, enough to make a paste of the consistency of thin cream. Clean the pulp chamber, root canal and abscess cavity thoroughly—exhausting all the pus from the sac at and around the roots—wash with alcohol and water equal parts, or with peroxide of hydrogen; dry as well as possible. Then with one of Donaldson's little bristles, made for cleansing root canals, with cotton fibers wrapped around it, dip into the gutta percha solution and introduce into the pulp chamber and roots, using the cotton wrapt broach as a piston to pump the solution through the root canal into the cavity of the abscess, continuing to force the solution through the root till it makes its appearance at the sinus opening. If it is found coming too freely, lay the finger on the opening, thus causing the solution to be forced into any and every place around the root, where the sac is, in this manner strangulating it and preventing the gathering of lymph to be subsequently decomposed into pus. The abscess is thus destroyed. The gutta percha, being an inert substance, becomes encysted; nature, thus assisted, goes on and closes up the sinus; and you will have no more fear than if there had never been an abscess. It has one more recommendation: to the patient, at least, it is painless.—*Dental Register*.

SOMETHING NEW IN MAKING RUBBER PLATES.

One of the features introduced as a novelty, at the late meeting of the Mad River Valley Dental Society, was a method of making vulcanite plates without the teeth attached; in other words, vulcanizing the rubber on the plaster model, using the plate or plates thus obtained instead of a wax base-plate for securing a bite, and finally attaching the teeth by a second process of vulcanizing. The idea is original, we believe, with Dr. Bradley, of Dayton, O. The advantages claimed for the method are such as

apply to swaged metallic plates, viz: greater accuracy in securing a "bite," in difficult cases, the opportunity of determining at an early stage of the operation whether a good fit has been secured, also the advantage of allowing the patient to wear and accustom himself to the plate before the teeth are attached. Dr. Bradley thinks the method of special advantage in all partial lower cases. The narrow rubber band at the lingual base of lower anterior teeth may be strengthened by cutting a groove with a fissure or wheel-bur, fitting into this a *brass* wire, and vulcanizing rubber over it. For attaching the teeth, the surface of the plate is treated with a solution of persulphide of carbon, after which, the teeth being in position, more rubber is applied, and the piece again vulcanized.

Dr. Adams, of Dayton, stated to the Society that the packing of the rubber, when the plate is first made, may be done as ordinarily, with the fingers and a blunt burnisher, after which the surface is covered with tin foil, the case invested and vulcanized. He dispenses with the wax base-plate, and consequently with the various steps of varnishing and oiling, and a second pouring of plaster in the flask. To be more explicit, the rubber strips are packed upon the face of the model *before* flasking at all, and then the model is invested at one operation and immediately vulcanized. It will be seen from this, that no pressure is brought to bear upon the rubber in closing the flask. Plates made in this way were exhibited to the Society. They appear to be quite as hard, tough, and strong as any made in the usual way, giving no evidence of porosity.—*Medical and Dental Journal*.

FILLING SENSITIVE TEETH.

In handling a sensitive tooth one needs to consider a few points, if he wishes to avoid hurting the patient. First, apply the dam, if possible, or at least keep dry with a napkin. Dry the cavity as usual, wiping out finally with a pellet merely moistened with alcohol. Apply this carefully. A pellet of cotton fully saturated with alcohol will cause pain, unless it is warmed before applying. It has been asserted that owing to the volatile nature of alcohol, it will abstract heat and cause pain, when applied in a cavity, whether it be first warmed or not. This is an erroneous impression, as a trial will show. If the cavity is quite sensitive, by all means warm the alcohol. Cut away the overhanging walls of frail enamel with sharp chisels. We have been cautioned not to use the mallet in this operation, for fear of checking off more than was intended. However, we generally use the mallet, judiciously. A patient shrinks less from a mallet blow than from a steady push cut. Having the cavity fully exposed, remove the decay with sharp spoon excavators, drawing from within out, as much as possible, and avoiding tearing away any considerable portion of the leathery decay at a single cut. Apply alcohol and warm air frequently. When the cavity is exquisitely sensitive, we sometimes wait half an hour or an hour after partially removing the decay, filling the cavity with dry cotton, and devoting attention to some other cavity. Time heals many wounds

and cures sensitiveness in teeth, under the above conditions. Apply no creosote or carbolic acid at present,—nothing but alcohol. We see from this the advantage of so applying the dam as to include several cavities, when great sensitiveness is anticipated. The dentist can usually find some one cavity less sensitive than others, with which to occupy himself while waiting. If his time is limited, he may often fill a small cavity, and before dismissing the patient, prepare several others for the gold, filling them with gutta percha, and leaving the completion of these operations for future sittings.

It will be observed that the use of the engine has not been referred to. After most of the decay has been removed and time for a thorough drying out of the tubuli has elapsed, the engine may be used for cutting out fissures, trimming edges, and preparing grooves or pits. We prefer very small inverted cones to the spear shaped drill, for drilling retaining grooves and pits. They should be new and sharp. After capping pulps and covering over with phosphate of zinc, many operators proceed at once to insert the gold, deeming the cement to have hardened sufficiently in a few minutes. It is often better to wait a day or two. The foundation of cement will then be found very hard and flinty.

No obtundent that we have tried, will sufficiently reduce sensitiveness, in an extreme case, to admit of the use of the engine bur directed at random in the cavity. Pressure towards the pulp must be avoided. We have seen a dentist make fire fly from enamel he was grinding with a fissure bur. Such operators labor under the disadvantage of reducing the patient to such an extreme of uneasiness and discomfort, as to render it almost impossible to do either themselves or the patient justice. Patients will cringe and shrink whether it hurts or not, under reckless handling.

Dryness, and the use of alcohol, are not new ideas, but they are too valuable to be allowed to be forgotten.—*The Medical and Dental Journal*.

NEW BRIGHTON, PA., October 13, 1887.

Messrs. Johnson and Lund, Philadelphia.

GENTLEMEN :—It affords me pleasure to say a word regarding your manufacture of artificial teeth. I now have them in use in the mouth for the past fifteen years, and they are still doing good service there. I do not think I average more than one broken or cracked block a year. My success has been greater in every way with your teeth than with any of the others made, and now I find it my interest to use them exclusively.

Very respectfully yours,

A. M. WHISLER.

Dentists' Pocket Diary and Appointment Book, FOR REGISTERING APPOINTMENTS.

THURSDAY.				188
8		1		
9		2		
10		3		
11		4		
12		5		

FRIDAY.			
8		1	
9		2	
10		3	
11		4	
12		5	

We show above the precise size and fashion of two-thirds of a page of the Appointment Book. It contains blanks for fifty-four weeks, three days being provided for upon each page, so that when the book is open it presents engagements for one week. The figures denote the hour of the engagement, and being without date, it is good for any time. It also contains a neat memorandum in the back part.

Flexible Cloth Cover, red edge,	\$.65
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**EXTRA TOUGH
GOLD FOIL.**

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COHESIVE.

EXTRA COHESIVE.

SOFT OR SEMI-COHESIVE.

Each Grade Uniform in Quality. Does not Ball up under the plugger. Its absolute purity is unquestioned.

Nos. 3 to 240.

Works with the utmost smoothness. Exhibits great softness under the burnisher. Possesses a wonderful amount of durability and toughness.

PRICE.

Per $\frac{1}{8}$ ounce,	-	-	\$4.00	Per $\frac{1}{2}$ ounce,	-	-	\$15.00
" $\frac{1}{4}$ "	-	-	7.75	" 1 "	-	-	30.00

Steurer's Plastic Gold.

We respectfully call attention to a new form of **Dental Gold**, that we have introduced to the profession under the name of "STEURER'S PLASTIC GOLD."

It is a chemically pure Gold in a plastic state, without admixture of any foreign substance, of a brown color and homogeneous appearance.

We claim the following advantages over all other forms of Gold heretofore used:—

1st. It is more cohesive.

2nd. It has a spreading quality before it is completely condensed, so that it can be moulded into any cavity.

3rd. A tooth can be filled in one-third of the time it takes with any other gold, simple hand pressure being sufficient to make a solid filling, the mallet (which is so disagreeable to most patients) can be dispensed with, and sensitive teeth, or those whose walls are frail, can be easily filled.

Beware of worthless imitations. Be careful to see that it is in the shape of small square pieces, packed in bottles, and labeled *Steurer's Plastic Gold*, because the imitations, although they may apparently work tolerably in the commencement, do not make a solid filling, but gradually crumble away.

AS WE HAVE TO PAY CASH FOR THE GOLD AND THE MARGIN
IS SO SMALL, WE MUST SELL FOR CASH ONLY.
PLEASE SEND CASH WITH ORDER.

Price Per Bottle, 1-16 oz., \$2.50. Sent postage free on receipt of price.

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EXTRA TOUGH GOLD PELLETS,

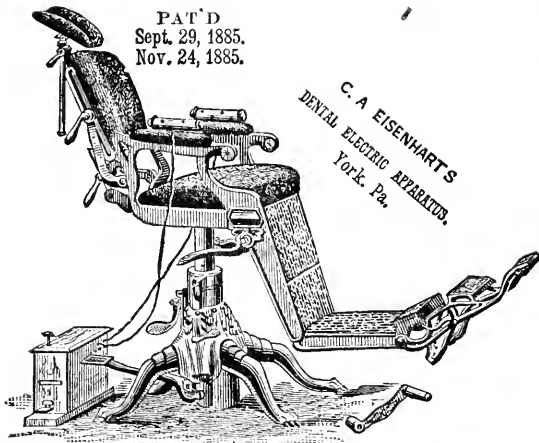
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\$4.00 per $\frac{1}{8}$ ounce.

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MERCURY,
Chemically Pure.
Try it. You will use no other.
1-4 lb. Bottle, 40 Cents.

Absorbent Cotton,
A SUPERIOR ARTICLE
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One Ounce, 12 Cts. Two Ounces, 20 cts

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Will bring out a perfect joint in Gum sections of rubber plates every time. Money will be refunded to any one who, after using according to the new directions, fails to accomplish what is advertised. No office right to buy. A sure preventive for dark or spread joints. This cement is prepared expressly for this purpose, and cannot be used for filling teeth. Since the introduction of our Cement, a manufacturer has bought a little carmine at a drug store, colored the powder of his Cement and makes the assertion that he has made it for years. We were the first to prepare a Cement for this purpose. Our packages contain eight times the amount of material sold by other firms.

Price, \$1.00 per package.

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CRYSTAL GOLD,

\$4.00 per one-eighth ounce.

JOHNSON & LUND,
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NERVE BROACHES,
THE BEST.
Assorted Sizes.
75 CTS. - PER DOZEN.

NERVE PASTE.
ARSENIC and CREOSOTE.
35 Cents per Bottle.

SPUNK.
FOR DRYING OUT CAVITIES.

Price, per oz.,..... 20
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SEPARATING FILES.

*J. M. EARNEST'S MAKE ARE THE
VERY BEST without doubt.*

No. 000, per dozen,.....\$1 25
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THERMOMETERS
For Vulcanizers,
THE MOST RELIABLE.
75 CENTS EACH.

PHENOL SODIQUE,
50 Cents per Bottle.

**FLASKS FOR
VULCANIZING.**

Malleable Iron, Each, - .75
Brass, " " - \$1.50

Orange Wood, for Wedging.

Per bundle, 10 Cts.

DENTAL FLOSS SILK.

Price, plain, per dozen, 90	Price, waxed, per dozen, \$1 50
" " " spool, 15	" " " spool, 15

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REDUCTION IN PRICE.

FRENCH
Separating Files,
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Per dozen,.....\$1 00

Shellac Sticks,
FOR
MOUNTING DISKS,

Per box,.....25c.

MEDICINE BOTTLES.

A small square glass bottle, with ground glass stopper, for Office Preparations; the stopper is flat on top, to receive a label.

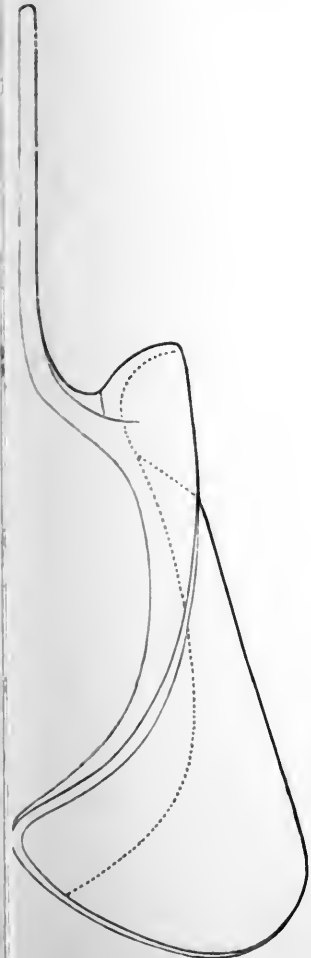
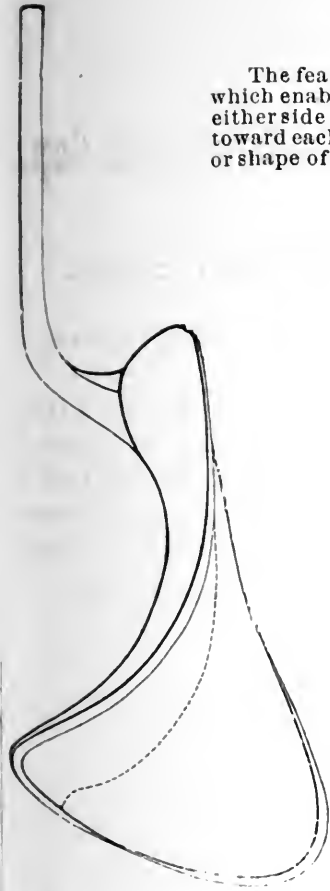
Per dozen,.....80 c.
Each,.....07 c.

LOWER IMPRESSION CUP.

Professor Henry J. Dorr's Pattern.

The features of remark in this Cup are the Posterior Lingual Wings, which enable the operator to obtain an accurate impression of the jaw on either side of the tongue. These wings can be spread apart or brought toward each other or twisted, or bent away to adapt the cup to nearly any size or shape of the edentulous lower jaw.

Price, each, 25 cents.





Lower Impression Cup,

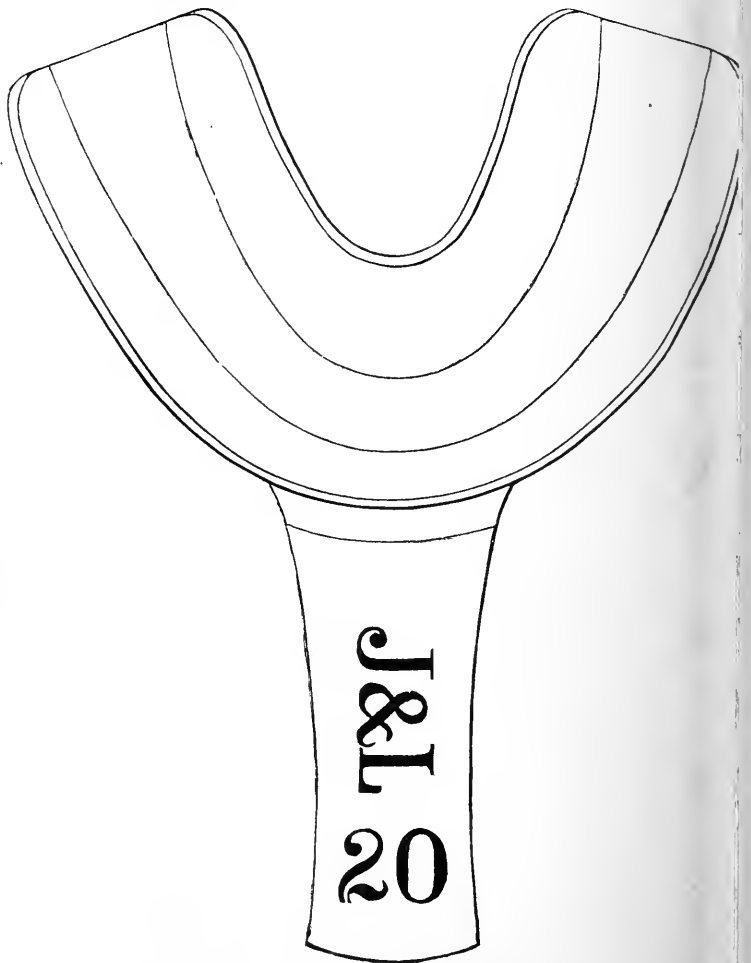
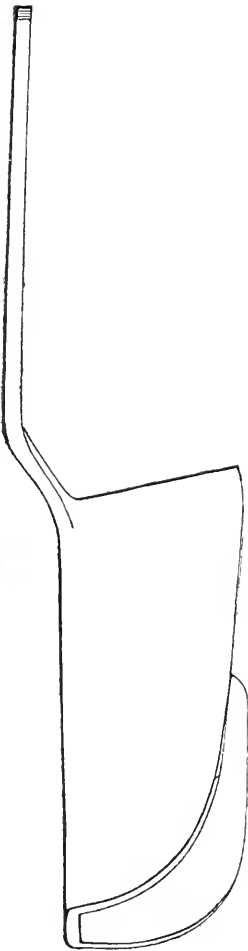
FOR

Partial Sets.

Dr. M. L. Long's Pattern.

The feature of this Cup is that it is very deep, so that an impression can be taken of any part of the lower jaw, no matter how diverse the remaining teeth may be situated.

Price, 25 Cents Each.



POSSESSES THE GREATEST FREEDOM FROM SHRINKAGE.

IT RETAINS ITS BRIGHTNESS.



oz. Troy.

EXTRA TOUGH GOLD AND PLATINA ALLOY

A notable Tooth Saver.

The proportions of Gold and Platina in this Alloy with the Combination of Silver, Tin, &c., cause it to harden quickly and to maintain its edge strength. Use as little Mercury as will make a stiff plastic filling, and place in cavity without washing.

JOHNSON & LUND,

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IMPERVIOUS to the SECRETIONS of the MOUTH.

WORKS WITH GREAT PLASTICITY AND PACKS DENSELY.

PRICES.

Per ounce	\$3 00
" half ounce	1 50
" two ounces purchased at one time	5 40
" three " " "	7 65
" four " " "	9 75
" five " " "	11 75
" ten " " "	20 00

When money accompanies the order the Amalgam will be sent postage free.

Virgin White Alloy for Front Teeth.

Trade Mark.



The prominent qualities of this Alloy are its WHITENESS and FREEDOM FROM SHRINKAGE. Fillings made of this Amalgam, in tubes five or six times the diameter of those usually employed in the "leakage test," with blue or purple ink, give no perceptible indications of permeation of fluid. Though designed especially for front teeth, yet it will stand mastication well anywhere in the mouth. For crown cavities, however, we recommend the EXTRA TOUGH GOLD AND PLATINA ALLOY, as that is made with especial regard to edge-strength.

PRICES.

Per ounce	\$ 2 00
" half ounce	1 00
" two ounces purchased at one time	3 80
" three " " "	5 40
" four " " "	6 80
" five " " "	8 00
" ten " " "	15 00

When money accompanies the order, the Amalgam will be sent postage free.

It Retains its Brightness.

It works with great Plasticity, and packs densely.

Oz. Troy.

Extra Amalgam.

GOLD AND

PLATINA ALLOY.

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It possesses the greatest possible freedom from shrinkage.

Impervious to the Secretions of the Mouth.

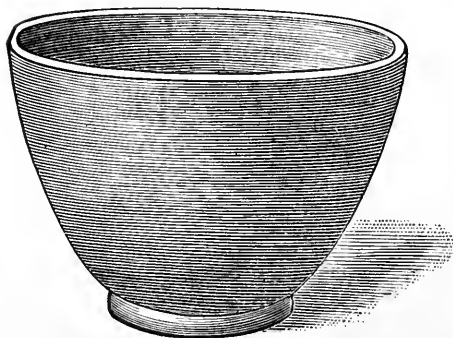
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RUBBER BOWL FOR MIXING PLASTER.



These Bowls are made of soft rubber, almost one-eighth of an inch thick. They cannot be broken. Their sides can be pressed together so as to form a lip or spout for pouring out soft plaster. The plaster that remains in them and becomes set can be thoroughly crushed and removed by squeezing the sides of the bowl together.

Inside measurement, $4\frac{1}{4}$ inches in diameter
by 31 inches in depth.

PRICE, 60 CENTS EACH.

DENTISTS' AMALGAM.

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THE DENTISTS' AMALGAM,



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Dr. J. W. MOFFITT.

It is composed of pure metals only. It contains no Cadmium or Bismuth. It will not discolor the tooth, or shrink from the cavity walls; in a word, it will not EXPAND, CONTRACT, or OXIDIZE. It requires LESS MERCURY in the process of Amalgamation than any other. For TOUGHNESS, STRENGTH, and RESISTANCE it has no equal.

Price, per Ounce,	-	-	-	-	-	\$5.00
" " Half Ounce,	-	-	-	-	-	2.50
" " Quarter Ounce.	-	-	-	-	-	1.25

"Prove all things, and hold fast to that which is good."

Metals, such as Cadmium and Bismuth, are not used in the manufacture of the DENTISTS' AMALGAM; this secures to the purchaser a greater bulk per ounce than in other Alloys.

This Amalgam having been thoroughly tested during the past quarter of a century and approved by the best practitioners, we deem it unnecessary to offer any of the numerous testimonials we have, to sustain its already well-earned reputation.

JOHNSON & LUND,

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ONYX CEMENT.

TWO COLORS.

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Exact size of the \$1.50 package.

A PHOSPHATE OF ZINC.

It is the strongest, most dense, and in all respects possesses greater uniformity in all the essentials of a First-Class Filling than any other offered to the profession.

Price, Package containing 1 color,	\$1.00
“ “ “ 2 colors,	1.50

Each package of the “Onyx” Cement will contain a small piece of the “Asbestos Felt,” so that the operator may have an opportunity of testing its value.

PHOSPHATE OF ZINC.

PREPARED BY DR. C. N. PEIRCE.

The packages will contain a small piece of ASBESTOS FELT, so that those desiring may have the opportunity of testing its value as a lining for cavities, and as a nerve cap.

Price, per package,	\$2.00.
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JAPANESE BIBULOUS PAPER.

REDUCTION IN PRICE.

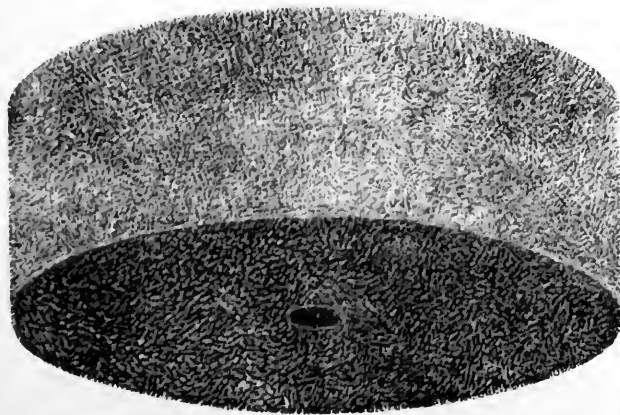
OUR OWN IMPORTATION.

We are just in receipt of a large invoice of Japanese Bibulous paper direct from Yokohama. By importing this absorbent directly from Japan, we save the profits which we have heretofore been obliged to pay to the importers, which enables us to have the pleasure of announcing to the profession a further reduction in price.

Price, per 100 Sheets,	\$.40
“ 500 “	1.75

Felt Polishing Wheels.

FINE FELT WHEELS FOR FINISHING.—SQUARE EDGE.



EXACT DIAMETER AND THICKNESS
OF No. 3.

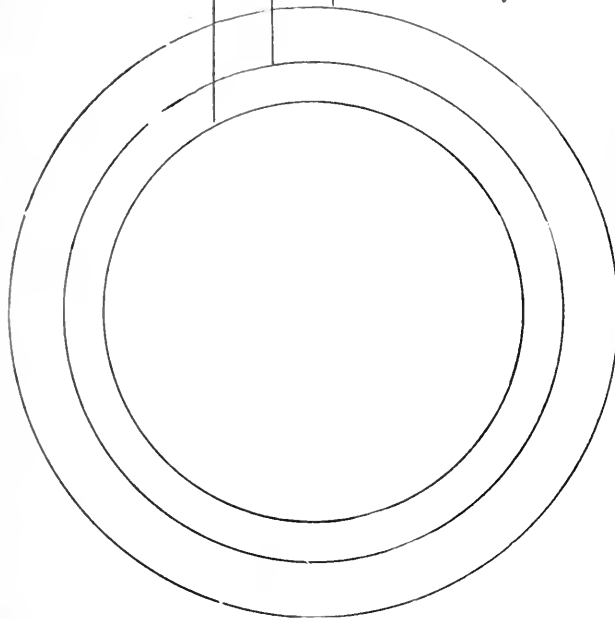


DIAGRAM OF DIAMETERS.

No. 1, $1\frac{3}{4} \times 3\frac{3}{8}$

No. 2, 2 3/8 x

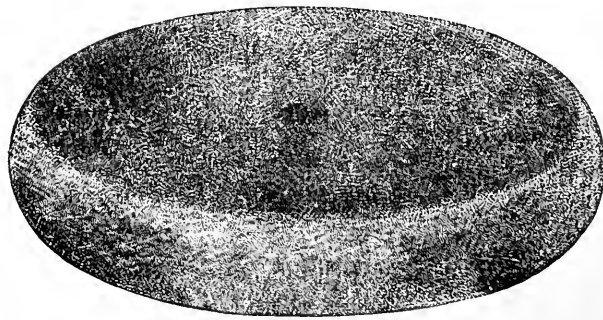
No. 3, $2\frac{1}{2} \times 7\frac{7}{8}$

13

[illegible]

FELT POLISHING WHEELS.

FINE FELT WHEELS FOR FINISHING.—ROUND EDGE.



Exact Diameter and Thickness of No. 3.

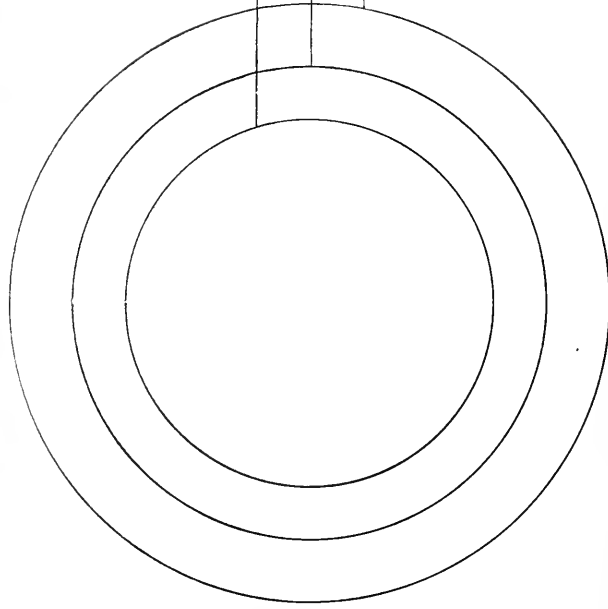


Diagram of Diameters.

No. 1, 1 1/2 in. x	1/2 in.	Each, 20 Cents.
No. 2, 2 in. x	1/2 in.,	" 30 "
No. 3, 2 1/2 in. x	1/2 in.,	" 40 "

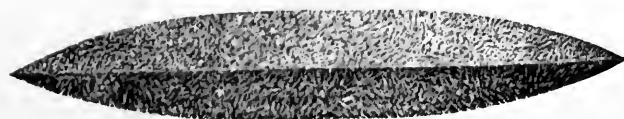
JOHNSON & LUND,

620 RACE STREET, PHILA.

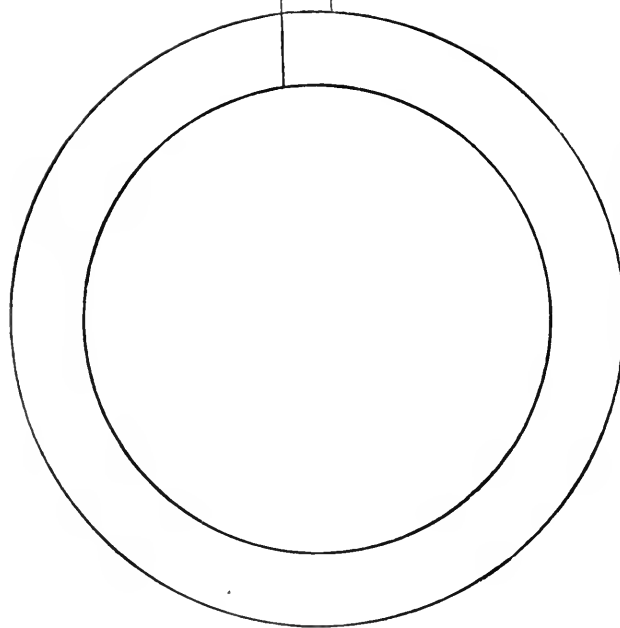
514 WABASH AVE., CHICAGO.

FELT POLISHING WHEELS.

FINE FELT WHEELS FOR FINISHING.—BEVEL EDGE.



Exact Diameter and thickness of No. 2, showing form of Edge.



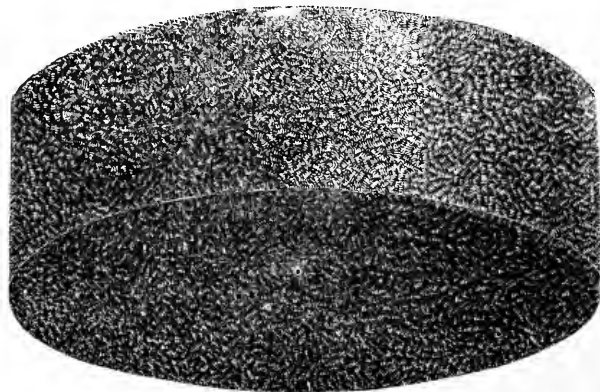
No. 1, 2	in. x $\frac{3}{8}$ in.	Each, 25 Cents.
No. 2, 2 $\frac{1}{2}$ in.	x $\frac{3}{8}$ in.	" 35 "

JOHNSON & LUND,
620 Race St., Phila.
514 Wabash Ave., Chicago.

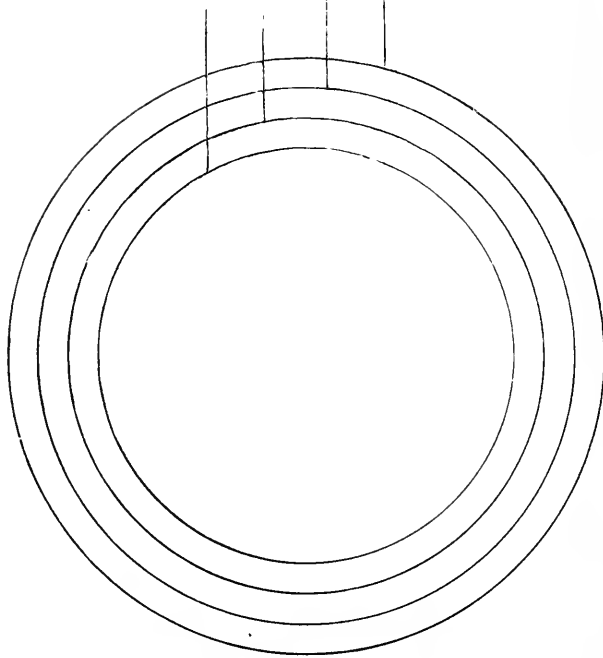
Diagram of Diameters.

FELT POLISHING WHEELS

COARSE FRENCH FELT WHEELS, FOR ROUGH WORK.—SQUARE EDGE.



Exact Diagram and Thickness of
No. 4.



No. 1, $1\frac{3}{4}$ in. x $\frac{3}{8}$ in.	Each, 10 Cents.
No. 2, 2 in. x $\frac{3}{8}$ in.	“ 13
No. 3, $2\frac{1}{4}$ in. x $\frac{1}{2}$ in.	“ 21
No. 4, $2\frac{1}{2}$ in. x $\frac{3}{4}$ in.	“ 35

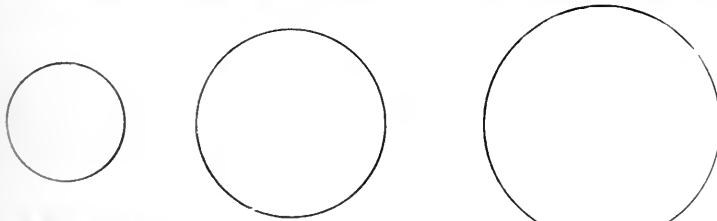
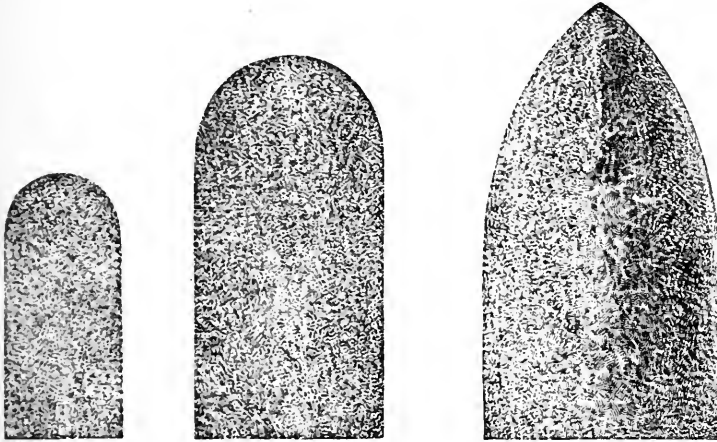
JOHNSON & LUND,

620 RACE STREET, PHILADELPHIA.

514 WABASH AVE., CHICAGO, ILL.

FELT CONES FOR POLISHING.

FINE FELT CONES FOR FINISHING.



Engine Cone
for Finishing Fillings.

No. 1.

No. 2.

Exact Size and Diameter of Cones.

Engine Cone, 1 in. x $\frac{7}{16}$ Each, 07 Cents

No. 1. $1\frac{1}{2}$ in. x $\frac{3}{4}$ in., for Polishing Plates.—Either Blunt
or Pointed, “ 20 “

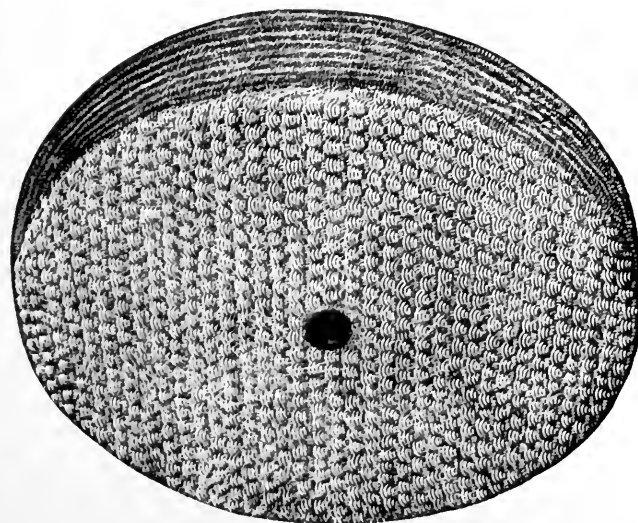
No. 2, $1\frac{3}{4}$ in. x $\frac{7}{8}$ in., for Polishing Plates.—Either Blunt
or Pointed “ 40 “

JOHNSON & LUND,

320 Race Street, Philadelphia.

514 Wabash Ave., Chicago.

COTTON DUCK WHEELS, FOR FINISHING PLATES.



Exact Diameter and Thickness of No. 4.

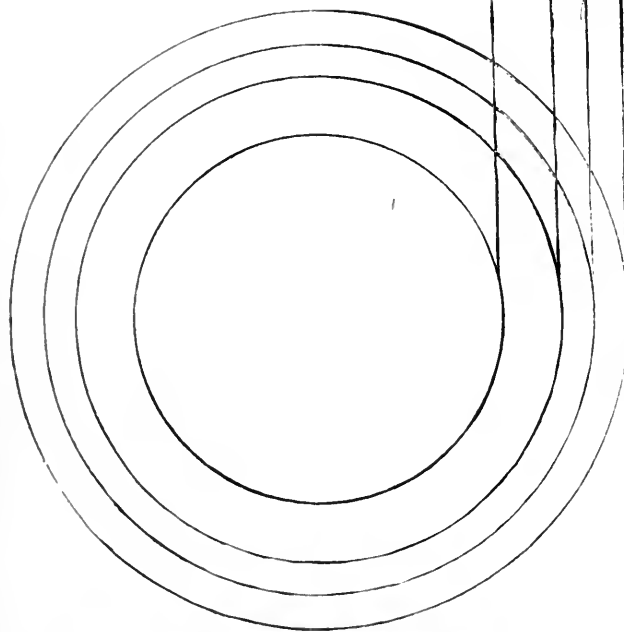


Diagram of Diameters.

No. 1, 1½ in. x ½ in.	Each 15 Cents.
No. 2, 2 in. x ½ in.	“ 25 “
No. 3, 2¼ in. x ½ in.	“ 30 “
No. 4, 2½ in. x ½ in.	“ 40 “

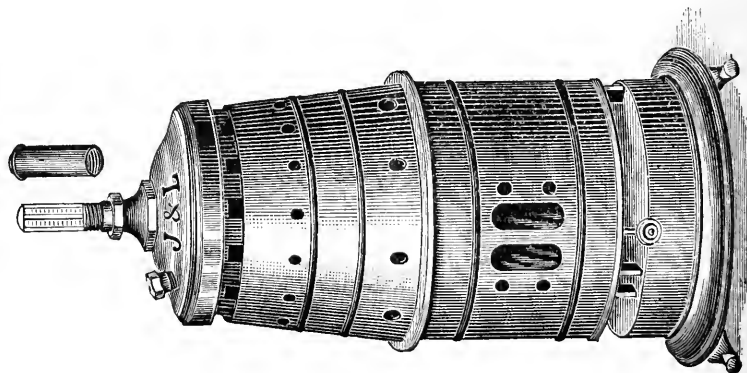
JOHNSON & LUND,

514 WABASH AVE., CHICAGO.

620 RACE STREET, PHILADELPHIA.

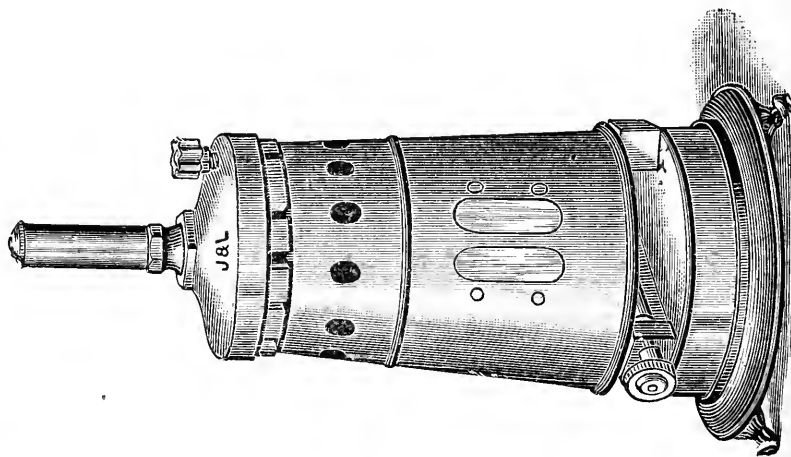
IMPROVED VULCANIZERS, MERCURY BATH, BRASS FLASKS, ETC.

20



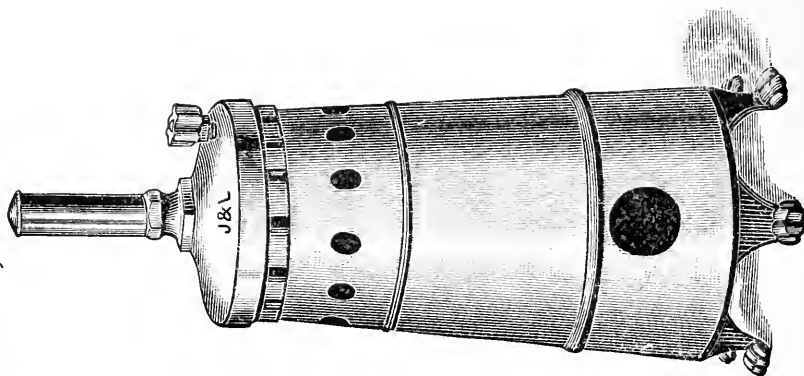
OUTFIT A.

Rigged for kerosene with Union stove.
One-case complete with Anchor Flasks, etc., \$14 00
Two-case ditto 15 00
Three-case ditto 16 00



OUTFIT B.

Rigged for kerosene with new attachment.
One-case complete with Anchor Flasks, etc., \$13 00
Two-case ditto 14 00
Three-case ditto 15 00



OUTFIT C.

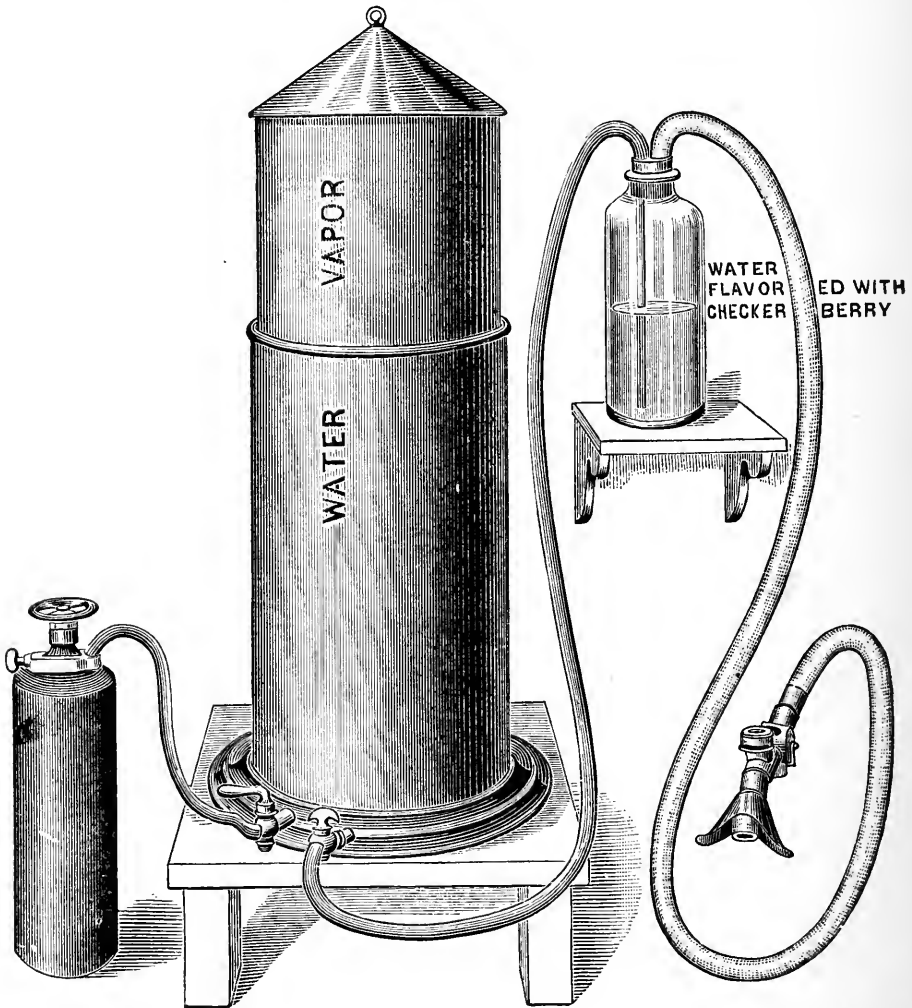
Rigged for gas or alcohol.
One-case complete with Anchor Flasks, etc., \$13 00
Two-case ditto 14 00
Three-case ditto 15 00

A New Discovery

A New Discovery!

FAR SUPERIOR TO LIQUID NITROUS OXIDE!

The Vegetable Anæsthetic.



It is without any of the objectionable features peculiar to other Anæsthetics, on the contrary it builds up the tissues, quickens the circulation and adds oxygen to the system. The properties of the herbs from which it is manufactured are hypnotic, diaphoretic, stimulative and antispasmodic. The patient awakens from the sleep refreshed and cheerful, and reports the sensations and effects as most agreeable. It is given to the youngest children, the most sensitive persons, as well as the aged and enfeebled, and no injury has resulted, or in the nature of the Anæsthetic can result from its inhalation.

As an assurance of the safety and perfect reliability of this new Vapor, we publish the following recommendation from physicians and dentists who have been, and are now, using the new Vegetable Anæsthetic:

"We have used the Vegetable Anæsthetic since January 1886—over a year—*exclusively*, in our practice, both for the extraction of teeth and minor operations in surgery. We have administered it repeatedly in heart disease, severe lung diseases, Bright's disease, etc., etc., where the patients were so feeble as to require

assistance in walking, many of them under medical treatment, and the results have been all we could ask. No irritation, suffocation nor depression, and so pleasant to inhale—in fact, from its many good qualities, we can heartily recommend it to all as the Anæsthetic of the age, and should very much regret going back to the use of nitrous oxide gas and ether.

FRIZZEL & WILLIAMS, Dentists.

FRIZZEL & WILLIAMS, Dentists,
Lee Hall, Lynn, Mass.

The apparatus consists of a cylinder, gasometer, inhaling bottle and inhaler, together with the different sizes of rubber tubing necessary. The advantages of a gasometer over a gas-bag must be self-apparent. The Vapor left in a bag after an operation soon evaporates; but it will remain in a gasometer an indefinite time. It is much more convenient and always ready.

The bottle acts as an indicator, likewise a stop-valve. No vapor can escape through the water until inhaled, and should the patient stop inhaling, it is at once detected, as the faintest inhalation causes the water to bubble.

DIRECTIONS.—Fill the tank to within a few inches of the top with water; balance the upper part of gasometer so that a faint bubble will be forced from the water in the bottle. Fill the bottle with water sufficient to cover the end of long glass tube, and flavor slightly with checkerberry; change the water—say every 100 gallons of vapor used.

PRICES:

Gasometer, with double wall and spigot for waste water.....	\$13 00
100 gallon Cylinder, empty.....	10 00
200 " " " ".....	10 00
500 " " " ".....	22 00
100 Gals. Vapor. 5c. per gal.....	5 00
200 " " " 4c. " ".....	8 00
500 " " " ".....	17 50
Connection.....	1 00
Indicator and Safety Bottle.....	2 00
Inhaler, Improved.....	10 00
Rubber Face Piece.....	1 00
Small Rubber Tubing..... per foot	16
Medium " ".....	25
Large Size " ".....	35
Tripod for 100-gal. cylinder.....	4 00
" " 200-gal. " ".....	5 00
1 oz. Checkerberry.....	50
Boxing Extra.....	

Analysis of Vapor made by James F. Babcock, Analytical and Consulting Chemist, State Assayer and Inspector of Liquors, late Professor of Chemistry in Boston University and Massachusetts College of Pharmacy.

VEGETABLE ANÆSTHETIC Co.:

Gentlemen—I have made a chemical analysis of a cylinder containing one hundred gallons of the Anæsthetic manufactured by your Company, and find that the same consists of a basis of nitrous oxide, combined with the volatile active principles of several well-known vegetable anodynes and sedatives, which are calculated to increase its efficiency. I find the Anæsthetic to be free from *chloroform* (which has sometimes been detected in compressed gas), and that it is likewise free from any dangerous or objectionable constituents. I cheerfully recommend this Anæsthetic to dentists and others as worthy of general confidence.

Respectfully, JAMES F. BABCOCK.

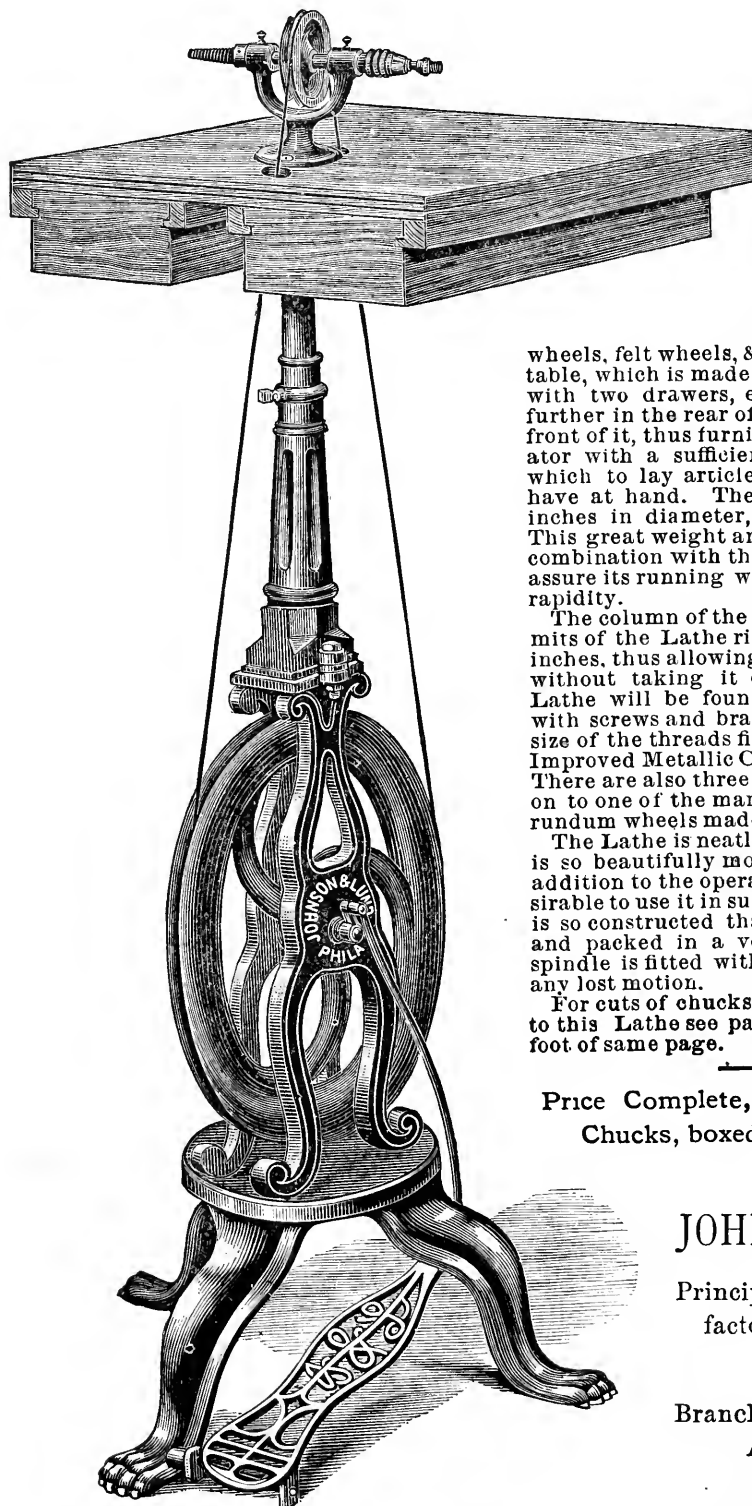
FOR SALE BY

JOHNSON & LUND.

620 RACE ST., PHILADA.

514 WABASH AVE., CHICAGO.

JOHNSON & LUND'S Improved Dental Lathe, No. 1.



In the construction of this Lathe we have introduced several novelties which only need to be seen to be appreciated. In the first place, one end of the spindle is made with a split-chuck and collar, which admits of the mandrels being changed with great facility and insures their running true; the other end of the spindle is made taper, to carry brush

wheels, felt wheels, &c. In the next place, the table, which is made of solid walnut and fitted with two drawers, extends about $1\frac{1}{2}$ inches further in the rear of the head than it does in front of it, thus furnishing the dentist or operator with a sufficiency of table room upon which to lay articles that it is desirable to have at hand. The driving-wheel is fifteen inches in diameter, and weighs 24 pounds. This great weight and enlarged diameter, in combination with the small size of the pulley, assure its running with great ease, power and rapidity.

The column of the Lathe, being hollow, permits of the Lathe rising and falling over six inches, thus allowing the cord to be tightened without taking it off. Accompanying the Lathe will be found three mandrels, fitted with screws and brass shoulders, one for each size of the threads fitted in Johnson & Lund's Improved Metallic Centre Corundum Wheels. There are also three brass chucks which screw on to one of the mandrels, for using with corundum wheels made without metal centres.

The Lathe is neatly painted and gilded, and is so beautifully modeled that it is quite an addition to the operating room, when it is desirable to use it in such a position. The Lathe is so constructed that it can be taken apart and packed in a very small compass. The spindle is fitted with an appliance to take up any lost motion.

For cuts of chucks and mandrels belonging to this Lathe see page 28 of adv. and note at foot of same page.

Price Complete, with Mandrels and Chucks, boxed, \$17.00.

JOHNSON & LUND

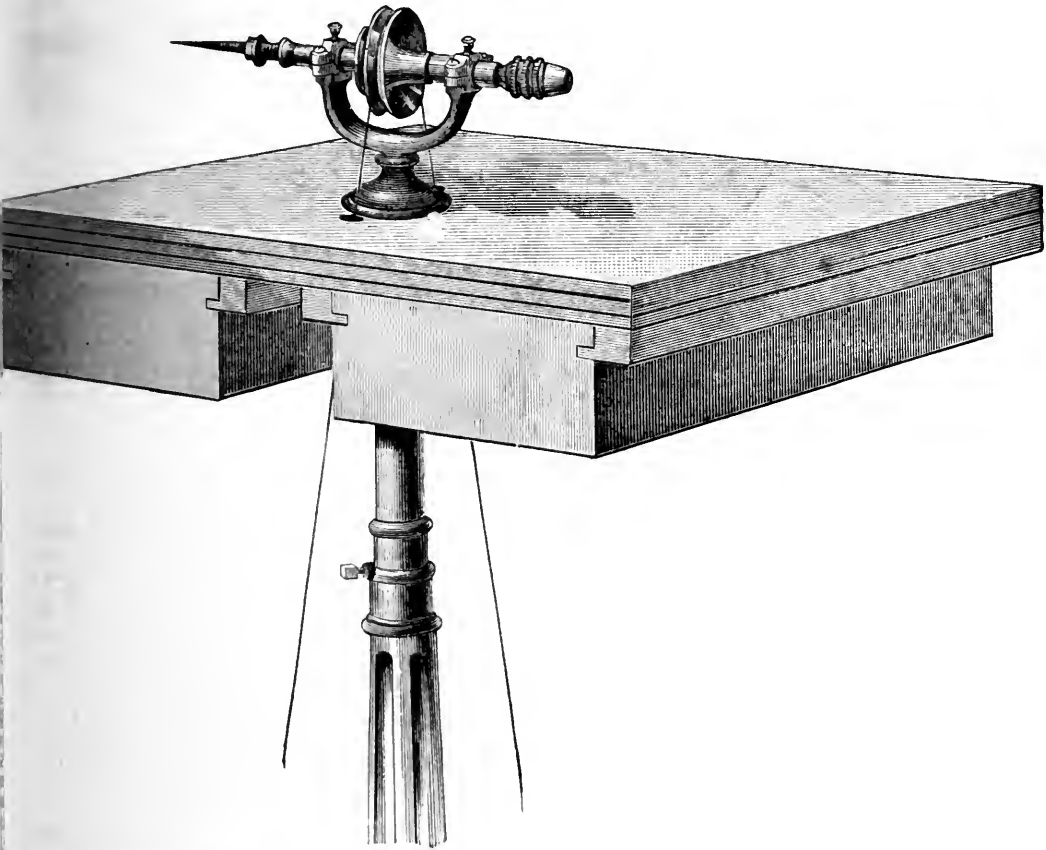
Principal Depot and Manu-
factory, 620 Race Street,
Philadelphia.

Branch Depot, 514 Wabash
Avenue, Chicago.

JOHNSON & LUND'S

IMPROVED

DENTAL LATHE, No. 2.



The stand and table of this Lathe are precisely the same as the stand and table of J. & L. Improved Lathe, No. 1. (See page 24.) The Lathe Head is an exceedingly fine article; the workmanship and materials being of the very best quality. The bearings are accurately fitted and so arranged that any lost motion which may occur by wear can be taken up with rapidity and accuracy. It is furnished with a cone-screw on one end and a split-chuck upon the other. The chuck is made with a cross-pin at the rear end, which is grasped by the split ends of the Mandrels, thus giving them very long bearings. The oil holes are covered with handsome metal screw caps. The spindle and pulley wheels are highly finished and the frame work is Japanned. The Lathe is so constructed that it can be packed in a very small compass.

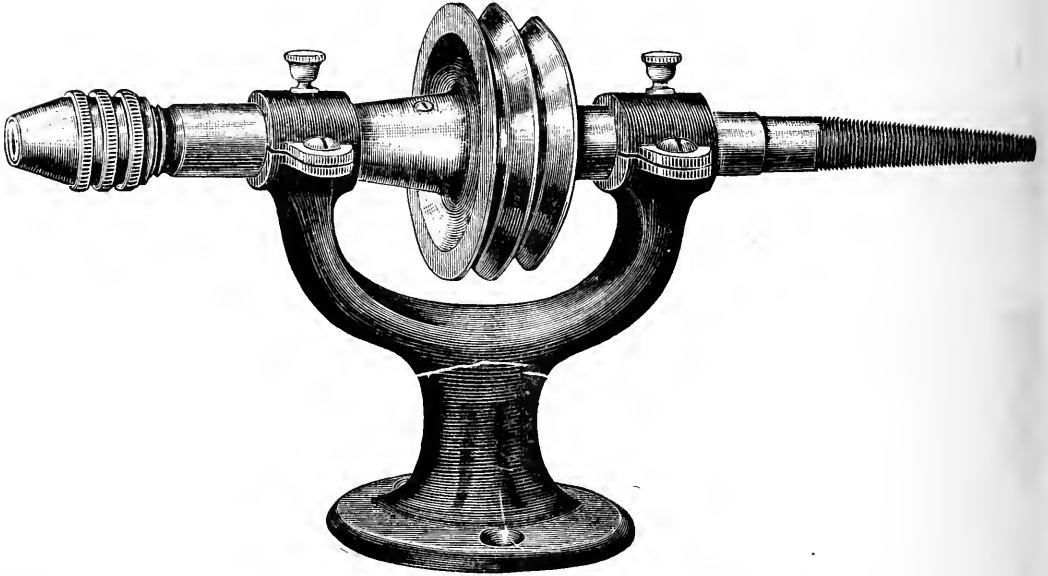
PRICE.

Lathe Complete, with ten Chucks,	-	-	\$22.00
" Without Chucks,	-	-	19.00

For cuts of the ten Chucks and Mandrels, see page 28 of adv.

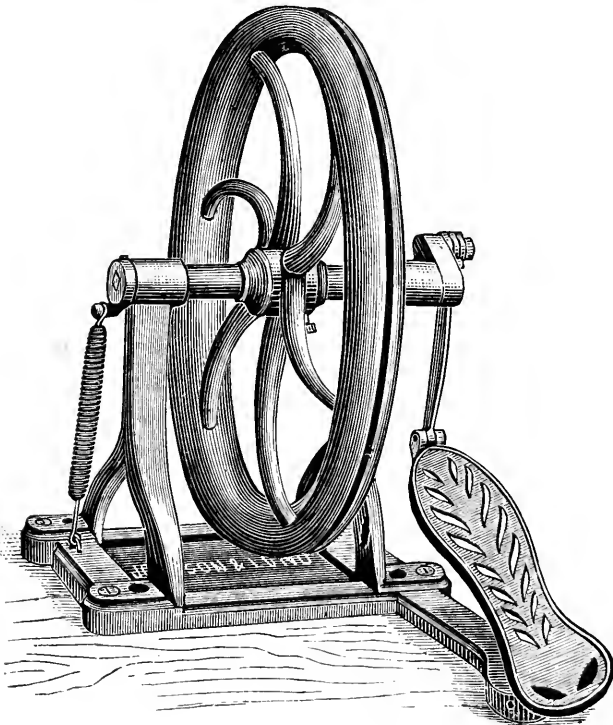
JOHNSON & LUND.

LATHE HEAD, NO. 1.



This Lathe Head is furnished with a split-chuck and collar, which allow the mandrels to be changed with great facility, and insures their moving true; the other end of the spindle is made taper to carry brush wheels, felt wheels, &c. Accompanying the Head will be found three mandrels, fitted with screws and brass shoulders, one for each size of the threads, fitted in Johnson & Lund's Improved Metallic Centre Corundum wheels. There are also three brass chucks, which screw on to one of the mandrels, for using corundum wheels made without metal centre. For the cuts of the mandrels and chucks belonging to this Lathe Head see page 28 of adv. and note at bottom of same page. PRICE COMPLETE, WITH MANDRELS AND CHUCKS, \$6.00.

The Lawrence Driving-Wheel.



This is by far the most serviceable foot-power ever offered for general use to the profession. The Wheel measures $18\frac{1}{2}$ inches in diameter, and weighs 45 pounds. The entire apparatus is handsomely painted, and each wheel is furnished with a spring, for the purpose of keeping the wheel, when at rest, off the centre and ready for action.

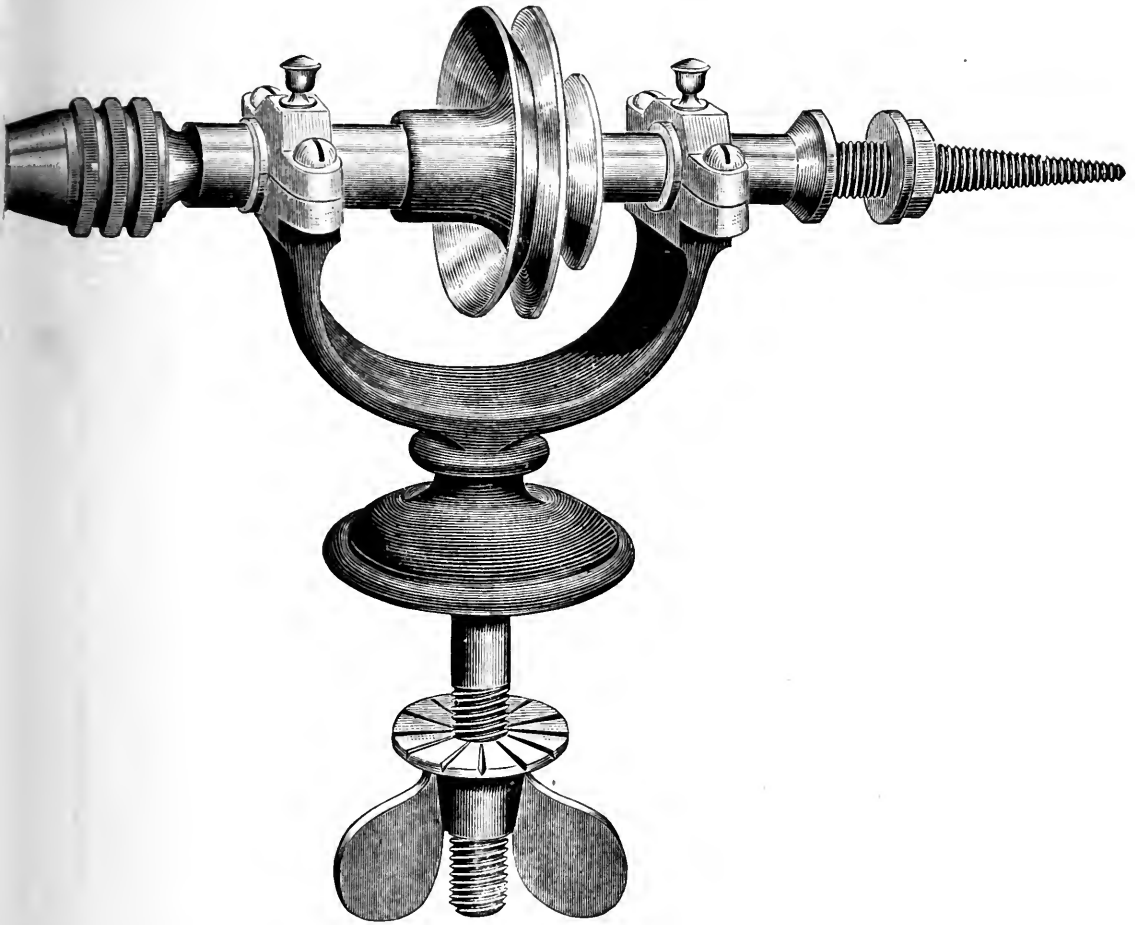
The cut is a faithful representation of the article itself.

—o—

Driving-Wheel \$11.00

Cord and Couplings50

LATHE HEAD, No. 4.

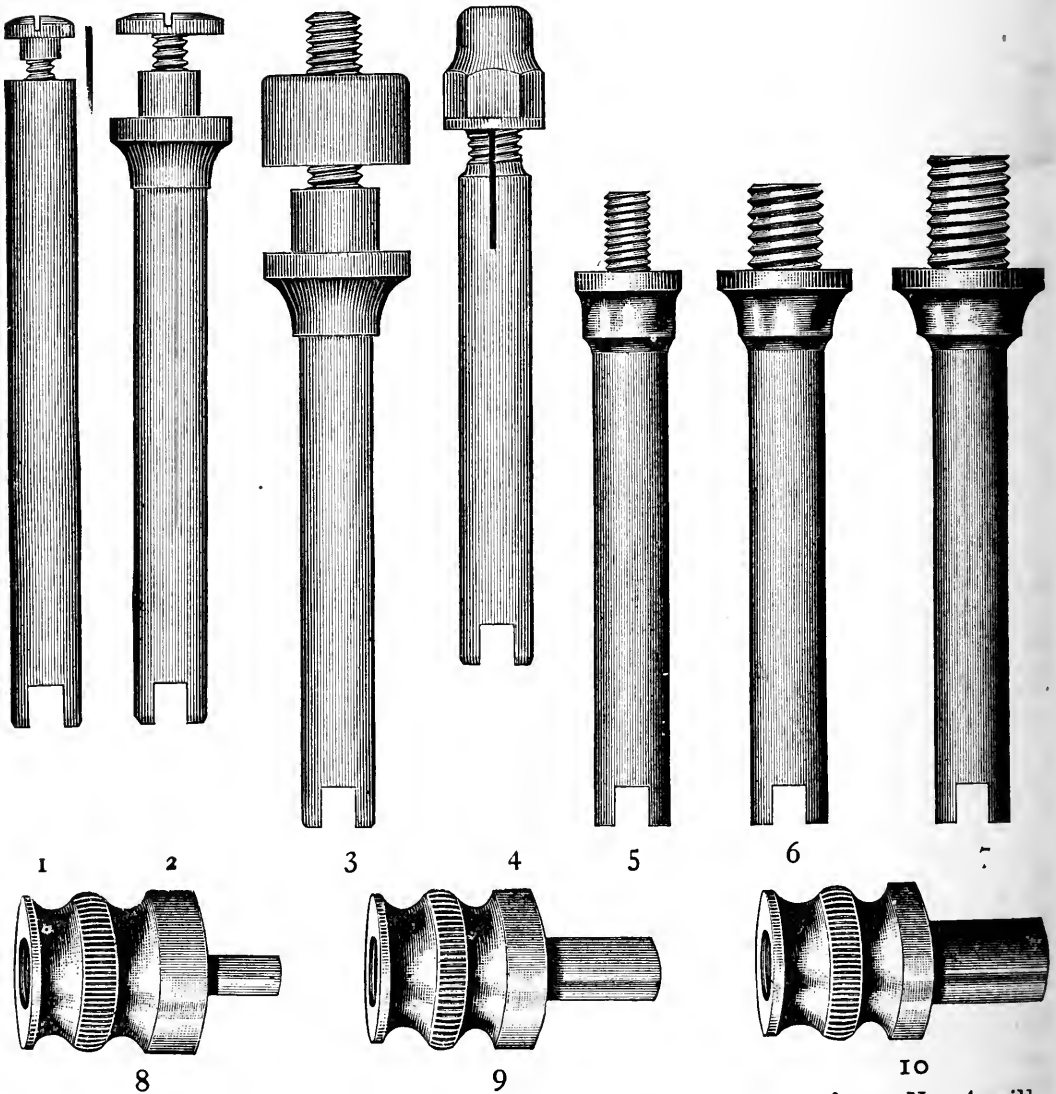


This Lathe Head in connection with the Lawrence Driving Wheel, makes the most complete and satisfactory Dentists' Lathe in the market. It is the best article of the kind ever offered. The workmanship and materials used are of the very best quality. The bearings are accurately fitted and so arranged that any lost motion which may occur by wear can be taken up with rapidity and accuracy. It is finished with a cone-screw on one end and a split-chuck upon the other. The chuck is made with a cross-pin at the rear end, which is grasped by the split ends of the mandrels, thus giving them very long bearings. The oil holes are covered with handsome metal screw caps. The spindle and pulley-wheel are highly finished and the frame work Japanned. Ten chucks and mandrels are supplied with the lathe, if desired. For cuts of chucks and mandrels see page of advertisements and note at foot of page 28.

PRICE.

Head complete, with ten chucks,	-	-	-	\$11 00
Head, without chucks,	-	-	-	8 00

Chucks and Mandrels for Lathe-Head No'4, and Johnson & Lund's Improved Lathe, No. 2.



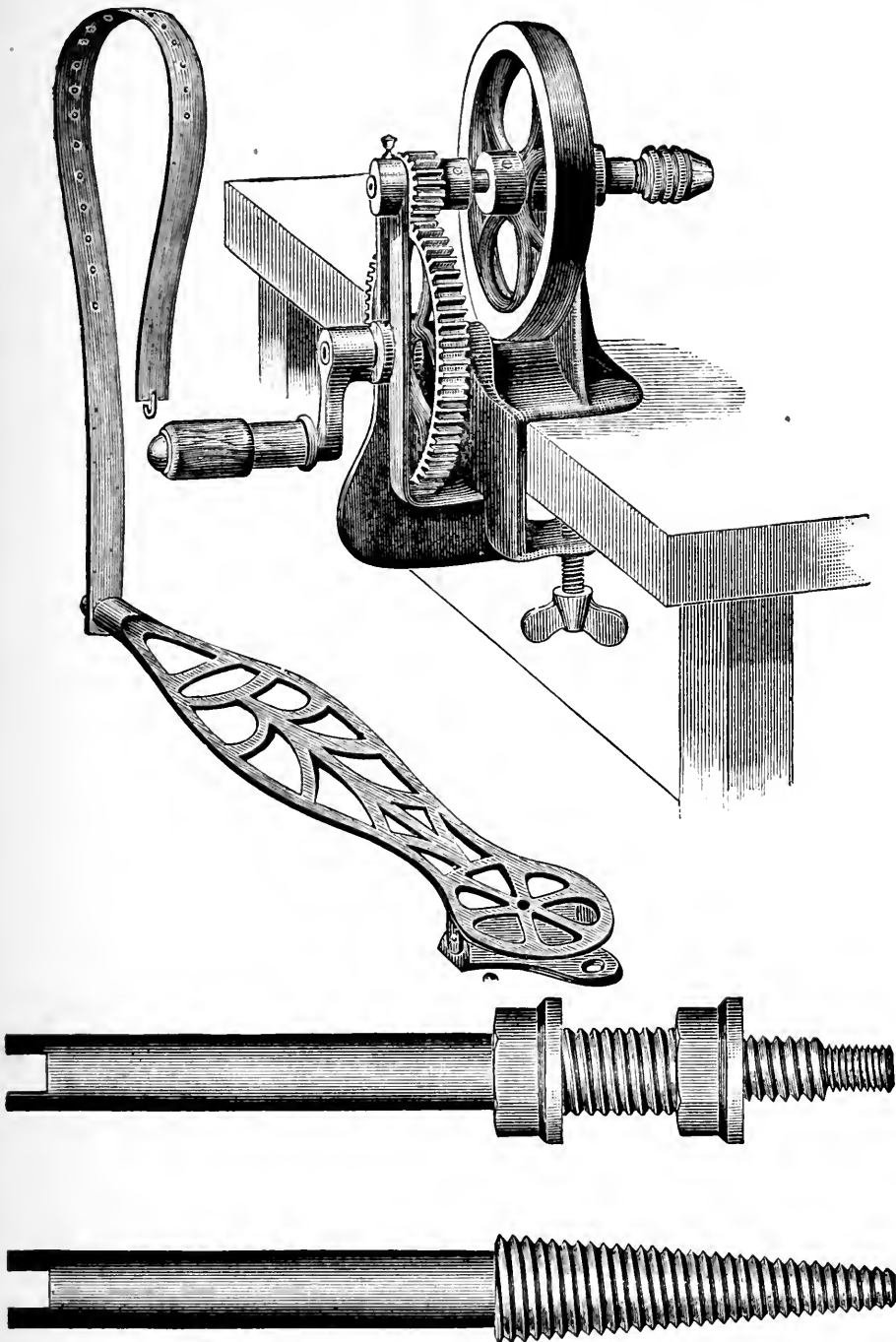
Nos. 1, 2 and 3 are screw chucks for corundum wheels, &c. No. 4 will carry engine burs, drills and tools. Nos. 5, 6 and 7 are screw mandrels for the improved metal-centre corundum wheels. Nos. 8, 9 and 10 are brass chucks fitting upon No. 7, and are intended for shellacing corundum wheels on.

PRICE.

Set of ten Chucks,	-	-	-	-	\$3 50
No. 1,	-	\$ 30	No. 5,	-	35
No. 2,	-	45	No. 6,	-	40
No. 3,	-	60	No. 7,	-	45
No. 4,	-	1 00	No. 8, 9, 10, each,	-	25

NOTE.—A set of Chucks to accompany Improved Lathe No. 1. Lathe Head No. 1 and Socket Lathe Head, consists of Nos. 5, 6, 7, 8, 9, 10. Illustrated above.

HAND AND FOOT LATHE.



The above cut illustrates our HAND AND FOOT LATHE. It is made with a Split-Chuck similar to the one fitted to our Improved Dental Lathe and various Lathe Heads. It is furnished with a taper Mandrel for the accommodation of Brush Wheels, Felt Wheels, Cones, etc., and with a Universal Mandrel which will fit any size of Corundum Wheel, Cone or Cup, made with the Improved Brass Centre, from the very smallest to the largest and thickest sizes. We also send with the Lathe three brass Chucks (illustrated on page 28 of adv.), which screw upon the Universal Mandrel for the convenience of those preferring to use Corundum Wheels without the metallic centre. The Lathe weighs, with two Mandrels and three brass Chucks, complete, seven pounds and twelve ounces. The geared wheels are machine-cut, and the workmanship throughout is of the best description.

PRICE, COMPLETE.....\$6.50.

SOCKET LATHE HEAD.

This Lathe Head is so constructed that it can be raised or lowered $4\frac{1}{2}$ inches. This admits of its being made to suit the height of the operator, and also to tighten the cord, without removing it from the Lathe. This Lathe Head is furnished with a split-chuck and collar, which admit of the mandrels being changed with great facility, and insuring their running true. The other end of the spindle is made taper, to carry brush wheels, felt wheels, &c. Accompanying the Lathe will be found three mandrels, fitted with screws and brass shoulders, one for each size of the threads fitted to Johnson & Lund's corundum wheels. There are also three brass chucks which screw on one of the mandrels, for using corundum wheels made without metal centres. For cuts of the mandrels and chucks which accompany this Lathe Head see page 28 of adv. and note at bottom of same page.

Price complete, with Mandrels and Chucks,\$7.00.

TWILLED RUBBER DAM.

A MOST EXCELLENT ARTICLE.

Highly prized by many on account of its twilled surface.

This Dam is only made 30 inches wide.

Thin, per yard,	-	-	-	-	\$1 00
Medium, "	-	-	-	-	1 50
Thick "	-	-	-	-	2 00

JOHNSON & LUND,

620 RACE ST., PHILA.,

514 WABASH AVE., CHICAGO.

M. H. SPENCER & CO.,

195 AND 197 W. SEVENTH STREET,

CINCINNATI, OHIO.

DEALERS IN

Artificial Teeth and all varieties of Dental Goods.

RUBBER DAM IN TINS,

1-2 POUND, \$1.50.

Extra Tough Coffer-Dam Rubber.

Packed in

Tin Cans.



Manufactured Expressly for

JOHNSON & LUND,

620 RACE STREET, Phila.

514 WABASH AVENUE, Chicago, Ills.

We take pleasure in calling the attention of the profession to a new article of Rubber Dam, made in the most careful manner of the best Para Rubber, no adulterations being used in the manufacture, the Dam consisting entirely of Rubber, sufficient of sulphur only being used to properly vulcanize it. It is cut in strips $8\frac{1}{2}$ inches wide and from $3\frac{1}{2}$ to 4 yards long, being a very handy size for general use. It is packed in METAL TUBES with a MOVABLE LID made as nearly AIR TIGHT as possible, in which the Dam can be kept, thus assisting very materially in preserving the strength of the material.

PRICE:

Per can containing $\frac{1}{2}$ lb. Thin,	-	-	-	per yard, \$1 00
" " $\frac{1}{2}$ " Medium,	-	-	-	" 1 50
" " $\frac{1}{2}$ " Thick,	-	-	-	" 2 00

Sent Postage Free on receipt of price.

Rubber Dam by the Yard.

35 Inches Wide. There is none made wider.

The Best Coffer-Dam Rubber.

Impossible to make any better—35 inches wide.

The above Rubber-Dam is made especially for us and to our own particular order, so that we know just what we offer to the profession and what we know is, that it is impossible to make any better. Some time since we were obliged to buy some Coffer-Dam Rubber, which was advertised as a VERY SUPERIOR ARTICLE to supply a customer who was impressed with the advertisement of the same, the result was, that he found it tender and returned it to us unfit to be used, we replaced it with our own; with which he was very well satisfied.

Thin,	-	-	-	-	per yard, \$1 00
Medium,	-	-	-	-	" 1 50
Thick,	-	-	-	-	" 2 00

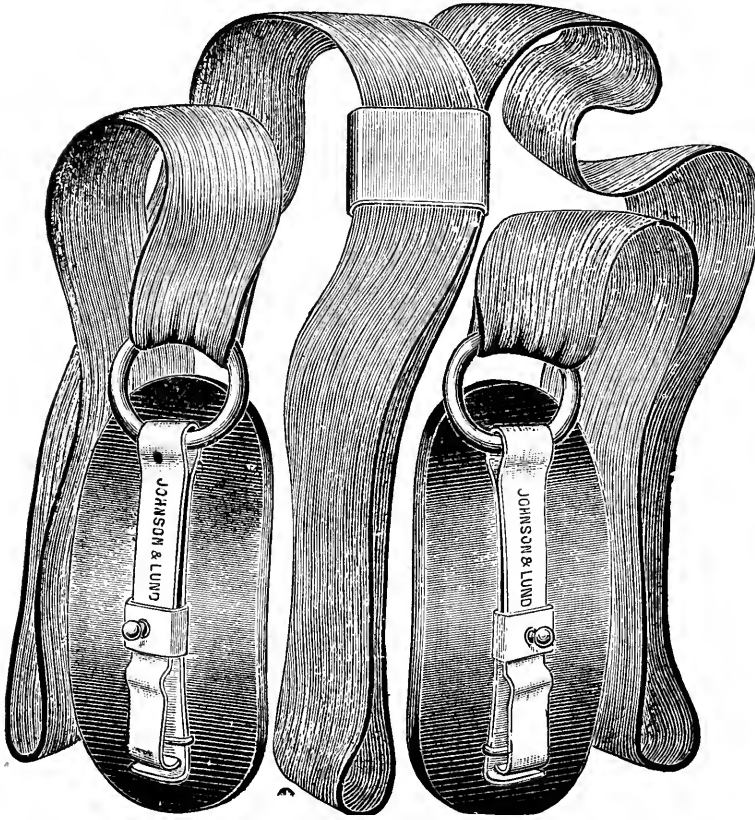
CAUTION.

Much of the Coffer-Dam Rubber advertised by other depots, and offered by their travelers is but $26\frac{1}{2}$ inches wide, is 20 per cent. less material to the yard than ours. For instance, our Medium $3\frac{1}{2}$ inch wide at \$1.50 per yard is as cheap as $26\frac{1}{4}$ inch of equal quality would be at \$1.12 $\frac{1}{2}$ per yard.

JOHNSON & LUND,

620 Race St., Philadelphia. 514 Wabash Ave., Chicago.

RUBBER DAM AND NAPKIN HOLDER DR. COGSWELL'S.



A very convenient and effective arrangement for holding the ends of the rubber back and up while operating. It consists of an elastic ribbon attached to two oval buffalo-horn plates, upon which spring catches are adjusted to hold a rubber or napkin. A broad elastic band passes around the head and is held in place by a tight-fitting slide. It is tightened or loosened without the inconvenience of a buckle.

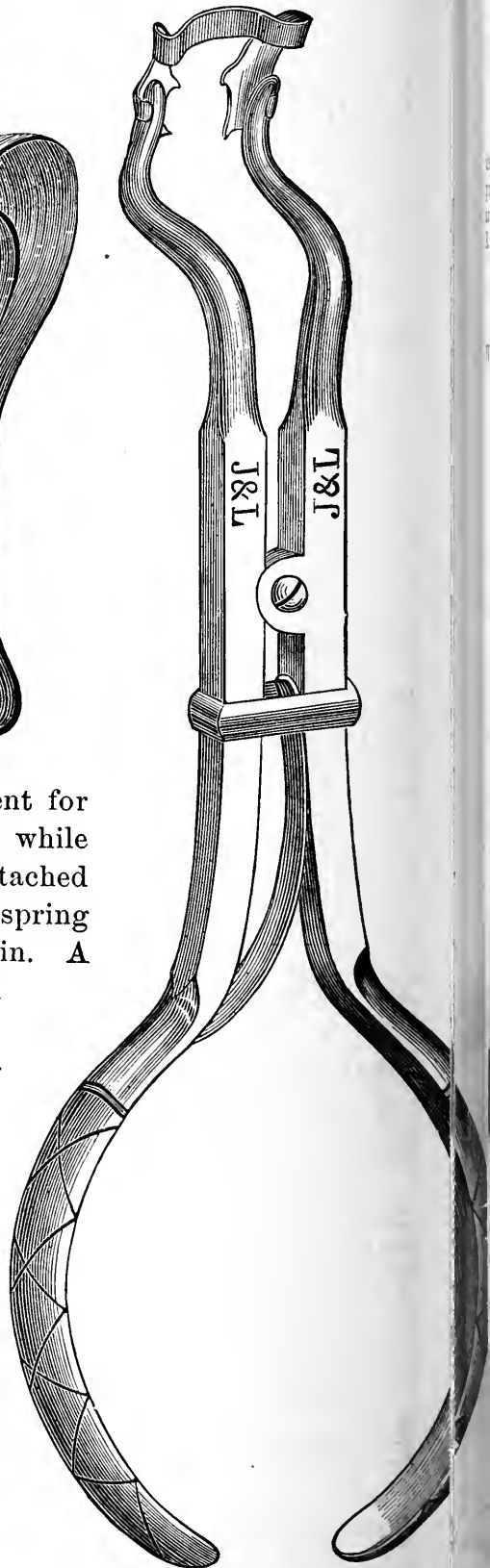
Dentists who have used the holder value it highly.

Price, \$1.00

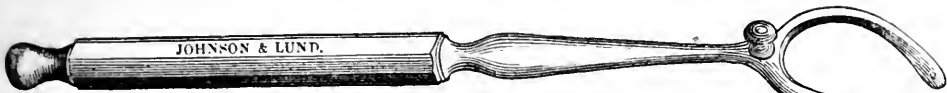
RUBBER DAM CLAMP FORCEPS

We here represent a Rubber Dam Clamp Forcep, combining the advantages of Dr. Bowman's and Dr. Allan's patterns. All these forceps have the lock slide, which keeps clamps and forceps extended and ready for use when necessity compels the operator to lay them down momentarily.

Forceps, Nickel plated (see cut) . . . \$2.00



RUBBER DAM APPLIERS.

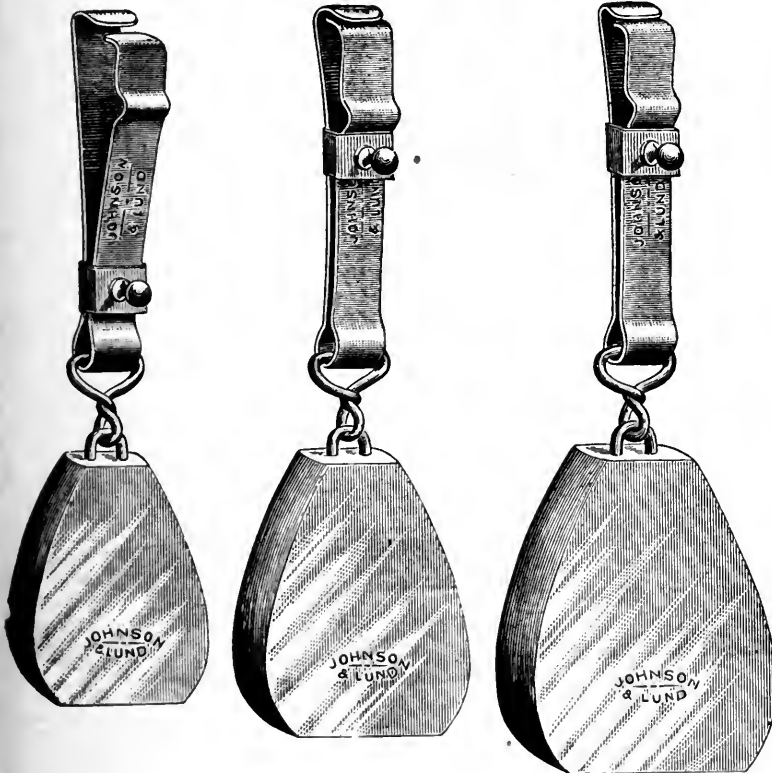


This instrument is designed for placing Rubber Dam between the back teeth. By passing the twine through the holes in the prongs of the instrument, and bringing the ends with one turn around the button, so as to keep it taut, and moving it with a lateral motion, the Rubber will be forced between the teeth.

PRICE:

With $\frac{1}{4}$ inch plain octagon,	Steel handle, ball ends (see cut), each,	\$1.25
" " " " " " "	Nickel Plated (see cut),	1.50

RUBBER DAM WEIGHTS AND SPRINGS.



These weights are intended to be attached to the lower margin of the Dam, when in use, serving to keep it out of the way of the operator.

They are of metal, handsomely nickel plated. The springs are of stiff metal, nickel plated. They are readily attached and removed from the Dam without tearing it.

There are three sizes. The small size weighs 1 ounce; the medium size weighs $1\frac{1}{2}$ ounces; the large size weighs $1\frac{3}{4}$ ounce.

Price, with Spring,
each, . 40cts.

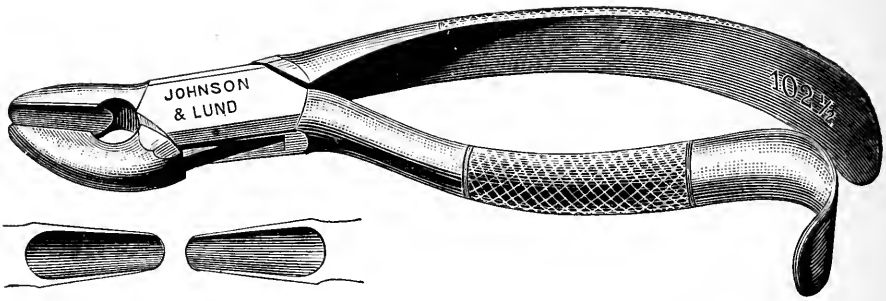
WOOD POLISHING POINTS.

Put up in Boxes containing 100 Points each.

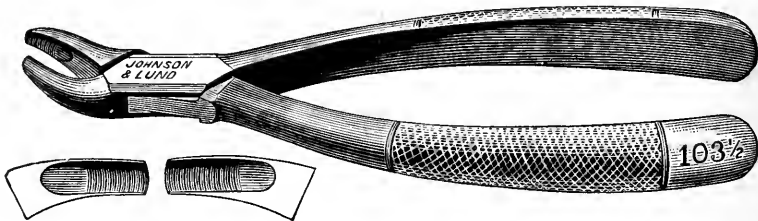
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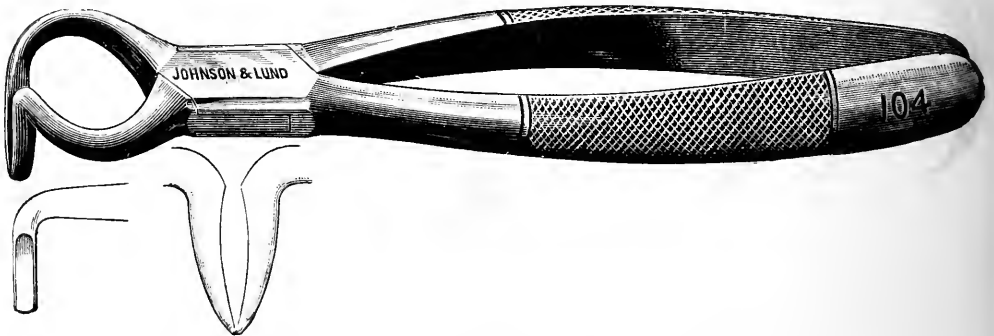
No. 1, per box,	\$1.00	No. 2, per box,	\$1.60.	Nos. 3, 5 and 6, per box,	80 Cents.
No 4, " "	2.40	No. 7, " "	1.25.	No. 8, " "	50 " "

No. 102 $\frac{1}{2}$. Incisors and Bicuspid.

Price, - - - - - \$2.25 each.

No. 103 $\frac{1}{2}$. Universal Children's and general Root Forceps.

Price, - - - - - \$2.25 each.



No. 104. (Dr. Ryding's) Lower Stump.

Either side, so constructed as to keep the cheek away from the beaks, and to enable the operator to see more clearly the stump he is about to extract.

Price, - - - - - \$2.25 each.

Dr. J. H. Woolley's Root Canal Dryer.



Patent applied for.

Dr. Woolley desires to call the attention of the members of the dental profession to an instrument devised by him to dry the root canals of devitalized teeth before filling.

The difficulty hitherto experienced by careful operators in thoroughly drying the root canal is obviated by this instrument, which is used as a substitute for cotton or other absorbents.

A heated copper broach is introduced into the root canal, thoroughly removing all moisture.

The ROOT CANAL DRYER has been used by many of our prominent dentists, and has been favorably received.

Description of the Instrument.

A.—Handle of the Instrument.

B.—Copper Cone which is reservoir for the storage of heat.

C.—Broach.

The Cone is screwed upon the end of the instrument handle, and both together form a chuck which holds the broach in place.

Directions for its Use.

Place the copper cone over a flame until the broach is well heated, and then pass the latter into the root.

Price for the Root Canal Dryer, \$2 00

JOHNSON & LUND.

620 RACE STREET, Philadelphia.

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Below Cost. Job Lot. Great Bargain.

3 WILCOX DENTAL ENGINES.

BRAND NEW.

One Wilcox Dental Engine, Wilcox Universal Hand Piece,	
Small Wheel, - - - - -	\$15.00
One Wilcox Dental Engine, Hodge Universal Hand Piece,	
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One Wilcox Dental Engine, Wilcox Universal Hand Piece,	
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Boxing either of the above 50 cents extra.

TERMS—Cash to accompany order.

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THE DUPLEX BURNER.



Very convenient for laboratory use, consisting of an ordinary illuminating burner and a large flame for the blow-pipe, these burners can be ignited alternately by rotating the upper portion upon the base; there is also a small jet which, when once lighted, ignites either flame, without being extinguished itself. By removing the tip from the illuminating burner, a flame suitable for waxing up and other purposes may be obtained. After being once lighted, the Duplex Burner is always ready for use.

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ANTISEPTICS and DISINFECTANTS.

SOLUTION CORROSIVE SUBLIMATE IN ALCOHOL (1 part to 10) for facilitating further solution in water (1 to 1000, etc.) per ounce, glass stoppered bottles, - - - - -		\$0.35
THYMOL, crystals, a pleasant disinfectant, per ounce, glass stoppered bottle, - - - - -		1.00
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GLYCEROL OF THYMOL (Thymol in Glycerine), (1 to 100), useful to disinfect the hands, instruments, etc., per ounce, glass stoppered bottles, - - - - -		.35
PEROXIDE OF HYDROGEN, for Bleaching and Antiseptic pur- poses, per ounce, glass stoppered bottles, - - - - -		.30
HYDRONAPHTHAL, the new disinfectant and antiseptic, safe, non-poisonous, and very powerful, per ounce, glass stoppered bottle, - - - - -		.65
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IODAL, a new substitute for Iodoform and without its unpleasant odor. An excellent application for purulent or gangrenous condition of the gums, per ounce, glass stoppered bottle, -		2.50

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In large town near Boston, doing good business. Reasons
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HIGHLY IMPROVED MODELLING COMPOSITION

FOR

Taking Impression of the Mouth, or any other purpose where
a Perfect Impression is Required.



DIRECTIONS.—Soften the Composition in hot water, and when soft enough work into the desired shape with the fingers; place it in the cup, and then soften the surface with dry heat. This makes the surface softer than the main body, it takes a better impression, and hardens quicker. Should dry heat be used exclusively, wet the fingers occasionally, to prevent the Composition from sticking. It is not necessary to oil the impression before pouring the plaster cast, as the Composition can be easily removed by immersing for a few minutes in hot water.

No. 0.—EXTRA SOFT.—This grade is for restoring any of the other grades which have become hard by frequent use; they may be mixed in hot water.

No. 1.—SOFT.—This grade is for use in cold water and in tender mouths, and softens at a low heat; hardens in two minutes.

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☒ **No. 2** will always be sent unless other numbers are specified.

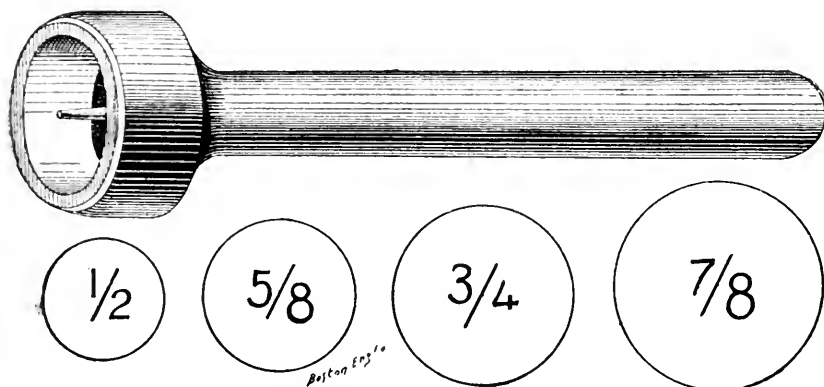
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DISK CUTTERS.

Suggested by Dr. S. G. Stevens.



Every Dentist can cut his own Sand Paper, Emery Paper, or Emery Cloth Disks
if he has one of these Cutters.

Price, either size, each, - - - - \$1.00

JOHNSON & LUND,

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DENTAL FLOSS SILK.

We offer the Best Dental Floss Silk in the Market—full
length, 12 yards on a spool, at the following low rates :

		Per Half Gross.	Per Dozen.	Per Spool.
Price, Plain,	- - -	\$3.75	\$0.75	\$0.08
“ Waxed,	- - -	7.50	1.50	.15

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Six quart can,	-	-	-	-	-	-	-	\$.70
12 " "	-	-	-	-	-	-	-	1.15
16 " "	-	-	-	-	-	-	-	1.45
24 " "	-	-	-	-	-	-	-	2.00
$\frac{1}{4}$ barrel,	-	-	-	-	-	-	-	1.60
$\frac{1}{2}$ " "	-	-	-	-	-	-	-	2.50
1 " "	-	-	-	-	-	-	-	3.50

The above are prices at the Philadelphia Depot. Freight and expenses will be added when sold at our other depots. Boxing Cans extra.

THE
Dental Office and Laboratory.
FOURTH SERIES.

VOL. 2.

PHILADELPHIA, APRIL, 1888.

No. 2.

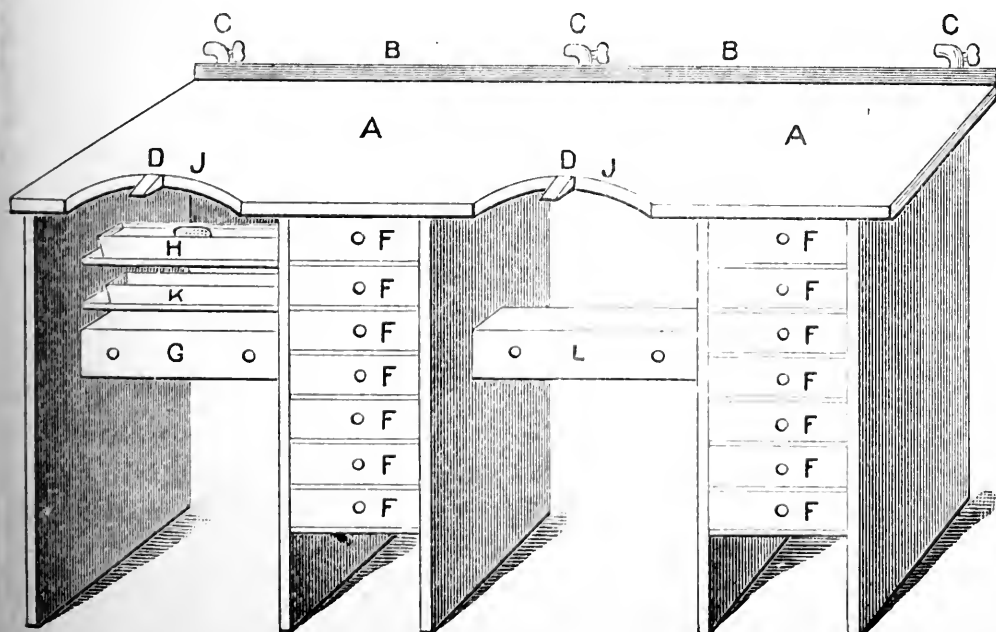
THE DENTAL LABORATORY.

BY THEODORE F. CHUPEIN, D. D. S., PHILADELPHIA, PA.

We propose in the following papers to set forth the arrangement of a dental laboratory, as well as to offer such suggestions for the conveniences of work, and appliances, and materials, as our experience dictates, to those who do their own laboratory work.

First, the *Work-bench*. This should be a shelf or table placed before a window. The top should be made of some hard close-grained wood, about *two inches* thick by not less than *eighteen inches* wide: and about *six or seven feet* long, and raised about *two feet eight inches* from the floor.

The table should have two sets of drawers, these being graduated in depth, to keep tools of larger or smaller dimensions, and each set of these drawers should be placed on the right side of semilunar cuts, removed from the top of the table. The following cut, Fig. 1, illustrates the work-bench.



JJ represents the semilunar cuts, with what is termed a *wedge*, at D in each. The wedge is mortised into the top of the table A, and is most convenient to hold the work against while filing. It is particularly recommended to have these places cut out from the top of the table instead of having the top of the table straight, as the filings fall more certainly from the wedge into the drawer below. This is of considerable importance to avoid loss or wastage when working with the noble metals, gold, platinum and silver. B represents a gas pipe with three outlets at C, to which rubber tubing may be attached, for such work as requires heat. F represents the drawers placed on the right side of the bench and to the right of the workman. These drawers should vary from *one inch* (inside measurement) to *four inches* in depth. In these drawers the tools should be kept *and not on the table*, except while working with them. G is a large, deep drawer, about three inches deep, placed in front of the semilunar cut under the wedge, and capable of being drawn out over the lap of the workman so that the gold box H may be put into it, to catch the gold or other precious filings when working in the noble metals. When not in use the gold box H is kept for convenience on a shelf out of the way, beneath the top of the table, as represented in the engraving. K is also a tin or sheet-iron box, kept as represented on its shelf when not in use, but put into the drawer G when working in silver. A description of the construction of the gold box will be given further on.

The tools, files, reamers, etc., should never be put into this gold box while working, as the filings adhere to them, and much loss or wastage is incurred in this way. It will be seen that the arrangement for gold and silver work is on the *left side*. On the *right side*, only a large drawer L is shown, as this part of the bench being used for vulcanite or celluloid work, no arrangement is made to catch the filings except the drawer to keep these, which are valueless, from falling over and littering up the floor. It has been suggested to keep the tools in a tool rack *on the bench*, but it has been our experience that tools are kept in better order in drawers, except when they are nickel-plated. By keeping each class of tools always in the same drawers and in the same place, the workman soon learns, by habit, just where to find the tool he wants. Thus the plyers, shears, nippers, slide tongs, plate punch, &c., &c., and tools of this class are kept in one drawer, and being in drawers are saved from the rust occasioned by the fumes of acid, water or steam. The files, reamers, mouth blow pipe and such small flat tools are preferably kept in the shallower drawers, and so on until each drawer has its tools, and a place or compartment for each class of tools; and in observing order and system while at work, not only much valuable time is saved but better work

can be accomplished than if the workman permits confusion to reign on his work-table, not knowing where to lay his hand on the tool he needs. "Clean up as you work" and do not permit dirt to accumulate, is one of the best rules for a laboratory.

The box for the gold should be made of tin. Its dimensions may be arbitrary, but we would recommend one of the following dimensions: Seventeen inches long, twelve inches wide, and two and a half inches deep. It should be bound along its edge with wire, to give it more strength, and a cover made to fit into it having a raised edge or rim a half inch high. In the center of this cover is a depression made of perforated tin, through which the filings fall into the box beneath. The following cuts (one of which is sectional), will better illustrate its construction.

FIG. 2.

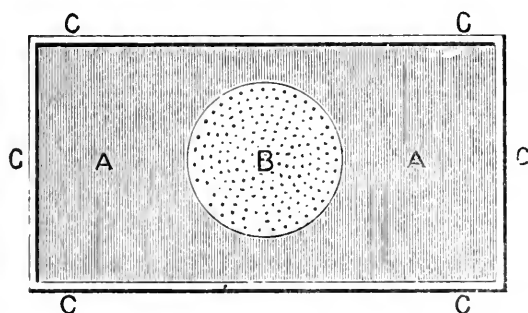
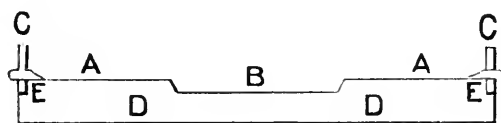


FIG. 3.

Fig. 2 represents a sectional view of the gold box cut through its center. C are the raised edges of the cover; A, the top of the cover; B, a depression in the cover made of perforated tin, through which the filings fall into the box D below. E represents the inner rim of the cover to hold it steadily on the box D.

Fig. 3 represents a full view of the cover, showing the edges C, the depression B, through which the filings drop, and A, the top of the cover.

With a gold box constructed as the one described, the saving by wastage of gold filings would soon pay for the cost of its construction.

Another convenience for gold and silver solder is a piece of marble instead of slate. We have had one for many years, and it will last, as far as wear is concerned, for ages. It is simply a piece of white unpolished marble slab, one inch, (or less) thick, five inches wide and six inches long. Towards one end two depressions are cut or sunk $\frac{1}{8}$

of an inch deep, one to keep gold and the other to keep silver solder in ; while the largest part of the slab is similarly cut or sunk for the purpose of rubbing up the borax with water. It is mounted for convenience and security against loss and dirt in a tin box to which a cover is hinged. Fig 4 illustrates the box. C is the cover, hinged to D, the box which holds or encloses the marble slab. B is the large depression for rubbing up the borax with water ; G the depression to keep gold solder in, S the depression for silver solder. M is the marble slab within the box.

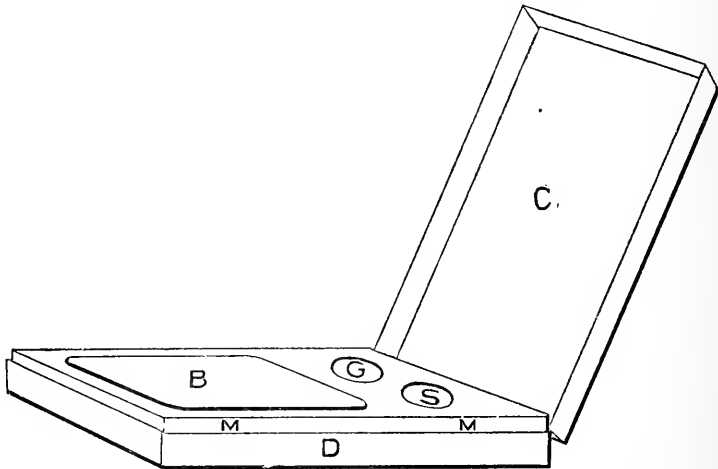


FIG 4:

We will describe the necessities of the laboratory, and will therefore begin from the time the impression is brought in for the construction of a set of teeth.

When such an impression is brought in, from an edentulous mouth, the chances are that this is perfect ; that is, in so far that in its removal from the mouth, the impression has not been broken. In partial cases however, where there are natural teeth remaining in the mouth, it is almost impossible to remove such an impression from the mouth without its being broken, in the effort to withdraw it, in quite a number of pieces. The first thing to be done then, when a partial impression is brought to the laboratory, is to replace the broken pieces so that the impression may be entire. For this purpose *adhesive wax* will be needed to stick the broken parts together, as also small pieces of *iron wire* to strengthen the parts thus gummed together.

ADHESIVE WAX.

This is made as follows:

Gum Demar	7 parts,
Wax	4 "
Vermilion (to color)	$\frac{1}{2}$ part.

After melting the above together, and before it gets entirely cold, it should be pulled like molasses candy and formed into small sticks like a lead pencil, for convenient use, the fingers being well oiled while doing this. In the absence of Gum Demar, rosin may be substituted, and it is recommended to increase the proportion of the gum to make the material harder in Summer or warm weather. The coloring material may be left out if thought proper.

The broken partial impression being approximated they are gummed together with adhesive wax. As there is not much strength however in this wax, small pieces of iron wire cut up in lengths of about one-half inch (and kept in a small box for use) are taken with the tweezers, held for an instant in the blaze of the spirit lamp, and dropped while hot, into the adhesive wax previously gummed to the broken impression. These pieces of iron wire should be laid at right angles to the crack or break in the impression to give support to the broken impression.

The partial impression being thus repaired, it, as well as an impression for an entire set of teeth, is next varnished with *shellac varnish*.

SHELLAC VARNISH.

To make this, a certain quantity of *gum shellac* is placed into a wide-mouth bottle and *alcohol* poured on it. It should be shaken from time to time until all the shellac is dissolved. This varnish is made thicker or thinner by the addition of more shellac or more alcohol. A stock bottle of it should be kept, and into a smaller bottle, fitted with a good cork and brush, a portion should be poured for constant use in the laboratory.

The impression (either partial or entire) is now coated with a thin solution of shellac varnish, and laid aside to dry. It is next coated with sandarac varnish.

SANDARAC VARNISH.

This is made like the other, only using *gum sandarac* instead of gum shellac. As there are, however, quite a quantity of little sticks, bark, and other foreign matter in the globules of this gum, a little different manner of procedure, to make this varnish, will be indicated. The alcohol having been poured on the gum, it is shaken for two or three days (or more), until the gum is dissolved. The varnish thus made is now strained through some fine muslin to free it of foreign matter. Like shellac varnish, it may be made thicker or thinner by the addition of gum or alcohol; and like it also, it should be kept in a stock bottle, while that needed for constant use kept in a smaller wide-mouth bottle fitted with a good cork and brush.

The impression having been coated with this varnish leaves the surface with high gloss which is imparted to the face of the model.

Before the plaster of paris is poured into the impression it is a good plan to put a pin into the depression of each tooth. This materially strengthens the teeth on the plaster model, and besides, seems as a guide to replace them in their exact position when they are broken from the model by accident or broken off purposely for the more easy removal of the model from the moulding sand when a die has to be made.

The impression being varnished and prepared as described with a pin in each tooth (the heads of the pins being cut off), it is placed in a basin of water and allowed to soak while the plaster is sprinkled on the water for making the model. The water is then well shaken from the impression and the plaster poured in little by little, beginning at one side and going gradually around until all the depressions are filled without air bubbles. The plaster may be mixed a little thin, for as there will always be some water adhering to the impression, this will thin it and render the flaw even and smooth. The pins for the purpose advised may be purchased at a trifling cost (about 2 cents a paper). The heads, with about an eighth of an inch of the pin, should be nipped off with *the cutting nippers*, and kept in one box. They are useful in pinning down metal chambers, patterns to the model when doing vulcanite work. The remainder of the pins should be kept in another box for the use already described.

The plaster of paris should be kept in a box to which there is a lid for the purpose of keeping it dry. A small *tin scoop* is convenient to have in the plaster box to remove the plaster from the box to the bowl.

Several bowls, of about a pint capacity, should be on hand, and a *teaspoon* and *spatula* will be found useful to convey the plaster from the bowl to the impression, as well as to build up or form the model to the desired shape. Should there be any plaster left in the bowl, after making the model, it is preferable to let this harden in the bowl (except this be in great excess); for when it is thus hardened, it is more easily removed from the bowls by simply immersing them in water, which causes the plaster to flake away or separate from the sides and bottom of the bowls.

A water bottle is convenient to have on the plaster bench. It may be fitted with a cork in which there is an outlet to let a small quantity of water pass out on being jerked or shaken, for the purpose of thinning the plaster, should it have been mixed too thick.

A slab of thick glass is also handy, whereon to invest small or large pieces of work for soldering, or to build up or form a model into shape for easy draft from the moulding sand. This slab should be about four or five inches square, and about 3-16 to $\frac{1}{4}$ of an inch thick.

A plaster knife will be needed to trim and dress the model into the proper shape for easy draft from the moulding sand, as for other uses.

A convenient arrangement to keep these last named tools in place is a piece of tin or sheet brass plate, about $\frac{3}{4}$ of an inch wide, bent into slots of sufficient capacity to hold the blades of the knife and spatula and the handle of the teaspoon. This is tacked against the edge of the plaster table and serves as a receptacle wherein each of these tools is kept in place. The cut below, Fig. 5, illustrates the arrangement.

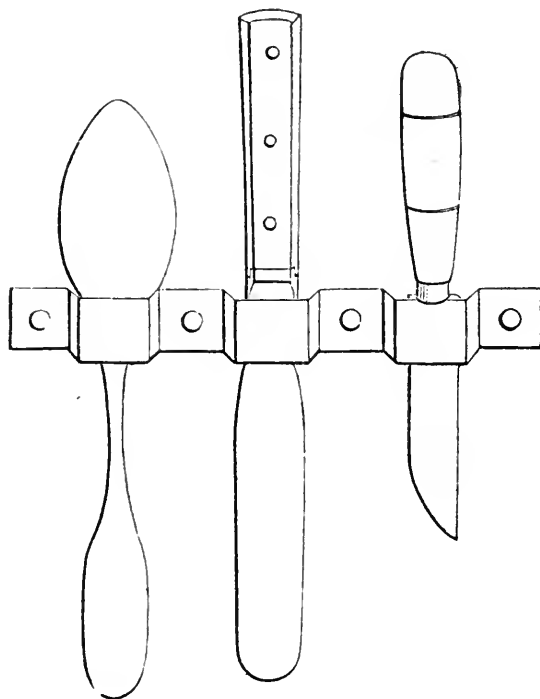


FIG. 5.

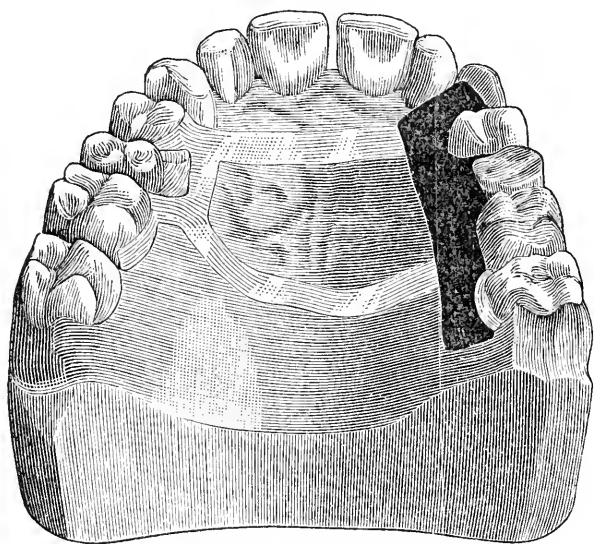
For metal work the model is made thicker or deeper than for Vulcanite work. When the plaster that has been poured into the impression and added to it, to give it the necessary depth, indicates that it has begun to set, the slab of glass is gently laid on it and the whole reversed so that the impression cup will be uppermost, when, with the plaster knife or spatula, the model is formed in the shape of a cone, that it may part readily from the moulding sand when a die is to be made from it. The model being removed from the impression, is trimmed into shape with the plaster knife. It is then coated with shellac or sandarac varnish. Should it be a partial case where clasps are used to sustain the plate, the clasps are bent first and accurately fitted to the teeth they are intended to surround. For the easier delivery of the model, in partial cases, from the moulding sand, the teeth may be carefully broken off from the model and laid aside; the pins used in the impression for strengthening the plaster teeth, serving as admirable guides in replacing them when they may be cemented again in place after the dies are made.

(TO BE CONTINUED.)

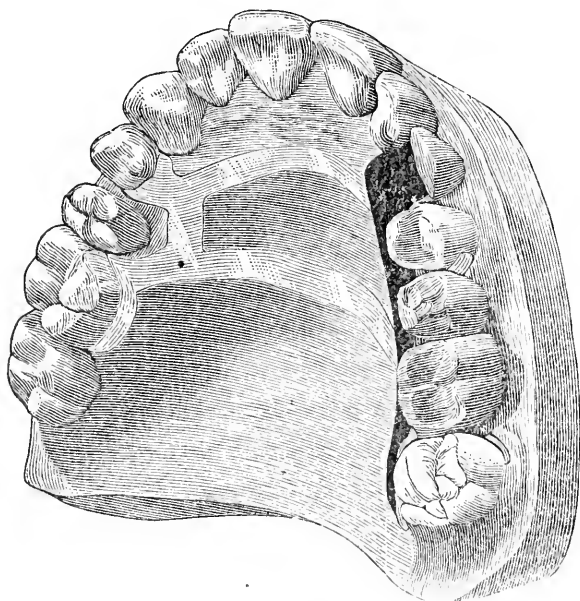
SKELETON PLATES.

BY DR. H. H. GANTZ, CLIFTON SPRINGS, N. Y.

I send you herewith a sketch of a skeleton plate that I made a short time ago, it being the second one that I have made, and as they proved so satisfactory to both patients and myself, I concluded that I would be justified in giving the profession the benefit of my method of making such plates. The cuts are good illustrations of the last plate made.



Full view of palate surface.



Diagonal view from left upper hand molar.

NOTE.—The dark shade at the base of the first molar on the Buccal side is intended to show where pink rubber has been used to meet the natural gum. The light shade represents the gold of the skeleton plate as well as the clasps. The 2d bicuspid on the left side of the cut represents a gold crown, and is, therefore, not used to clasp to.

The patient, a lady, extremely nervous, and having lost the left cuspid, second cuspid and first molar, applied to me to have them inserted. Having had some experience with her, I feared she could not tolerate a plate in the roof of the mouth, and I did not deem it advisable to attach the teeth by banding, hence I concluded to make the skeleton plate. The process is very much the same as making an ordinary gold plate. After you have your dies, cut a narrow strip of gold or platinum plate large enough to form a saddle where teeth are to be inserted, extending up on the buccal surface of the gum as high as you want it to make a finish, and inside on the palatine surface, just far enough to solder your stays for fastening the

teeth on with rubber. Next take two strips of heavy spring gold, about No. 22 thick, and 3-16 to $\frac{1}{8}$ inch wide, lay each one on your zinc die from one side to the other from the teeth you intend to clasp; then swedge them up—each one separately—then place gold saddle and both bars on zinc in their proper places; swedge again, then by holding one end of one of the bars in its proper place on the saddle with tweezers, solder it there; the other bar the same way; then the ends of the bars together, or to a saddle on opposite side, if there be one; swedge lightly again. Now place it in the mouth, so that the bars fit to roof of mouth and the saddle to the gums, if all is right. Now take an impression with plaster if you can, or composition if you *must*.

After obtaining cast, cut and fit your clasps and solder in the usual way. After the clasps are on, place the skeleton in the mouth again, take the "bite," articulate, grind on your teeth, try in the mouth again, to see if there is any doubt about the bite; if all right, invest and vulcanize, finish up and polish, and you will have the satisfaction of having done a neat piece of work and given your patient the *best* appliance that could be made, not *excepting a bridge*. Now, I have not written this for the benefit of those who have made these same skeleton plates for the last ten, twenty or thirty years and kept it to themselves, but for those who may wish to know that such an appliance can and has been made, and has proven a success.

THE PRACTICAL PLACE.

EFFECTS OF STUDY ON THE TEETH.—Among the hard-worked pupils of the Paris public schools the teeth become deteriorated in a few weeks after entry. The second dentition is often premature. These observations confirm the statements of Dr. J. L. Williams, who has given great attention to this subject. He has shown that any mental strain shows itself upon the teeth in a short time, both in increased decay as well as in increased sensibility of dentine. Dr. D. M. Parker has reported that these same changes are always apparent in men who are training for athletic trials.—*Boston Medical Journal*.

AMERICAN DENTISTRY ABROAD.—Among the new companies lately formed in London is one entitled the American Dental Institute. Capital 1,000*l.*, in shares of 1*l.* each. Object: to promote the adoption of advanced American and other scientific methods of dental surgery; to protect the interests of dentists and the profession of dentistry; to consider all questions connected therewith; to promote or oppose legislative and other measures affecting the profession; to collect and

circulate statistics and information in regard thereto; to act as and to appoint arbitrators for the settlement of any disputes in connection with dentistry.

LIQUID CEMENT OR GUM.—To make one gallon of the gum, about one and a half gallons of water, 3 pounds of glue, 4 ounces of borax, and 2 ounces of carbonate of soda, or an equivalent of any alkali, are taken. The glue and alkaline salts are dissolved in the water by heat, and the solution is kept at a temperature a few degrees below boiling point for 5 or 6 hours. The continued application of heat renders the gum permanently liquid at the ordinary temperature. After allowing the sediment to settle, the clear liquid is evaporated to the required consistency.

A WOODEN case containing a complete set of surgical instruments, many of which are similar to those used at the present day, was a recent discovery at Pompeii.

THE curvature of the earth is such that a straight line a mile long would be 2.04 inches from the surface at either end.

PARSON'S LOCAL ANÆSTHETIC.

Chloroform	12	Parts.
Tr. Aconite	12	"
" Capsicum	4	"
" Pyrethrum	2	"
Oil Cloves	2	"
Camphor	2	"

Dissolve the camphor in the chloroform, then add oil of cloves, and then the tinctures.

The venerable Dr. Parsons, in sending this formula for publication says: "I cannot expect to remain much longer in this world, and I want the profession to know the value of this local anæsthetic."

A NEW HEKTOGRAPH.—The latest issue of the *Papier Zeitung* gives the following instructions for making a cheap and handy hektograph:

Soak 4 parts of best white glue in a mixture of 5 parts pure water and 3 parts ammonia, until the glue is thoroughly softened. Warm it until the glue is dissolved, and add 3 parts of granulated sugar and 8 parts of glycerine, stirring well and letting it come to the boiling point. While hot, paint it upon clean white blotting paper, with a broad copying brush, until the blotting paper is thoroughly soaked and a thin coating remains on the surface. Allow it to dry for two or three days and it is then ready for use. The writing or drawing to be copied is done with ordinary hektograph or aniline ink upon writing paper. Before trans-

ferring to the blotting paper, wet the latter with a sponge or copying brush and clean water and allow it to stand one or two minutes. Place the written side down and stroke out any air bubbles and submit the whole to gentle pressure for a few moments, remove the written paper, and a number of impressions can then be taken in the ordinary way. When the impressions begin to grow weak, wet the surface of the hektograph again. This hektograph does not require washing off, but simply laying away for 24 to 36 hours, when the surface will be ready for a new impression.

TREATING A COLD.—Dr. Sedgwick has adopted the following method of treatment for cold with the greatest satisfaction. At the very outset of the attack he gives the following mixture:—℞. Liq. morphinæ acet., *m* 30; liq. ammon. acet., ʒvj; spir. chloroform, ʒj; aq. camph. ad. ʒvj; misce. A tablespoonful to be taken in the forenoon and afternoon, and two tablespoonfuls at bedtime. If there be an irritable dry cough, he gives in addition one drop of ipecacuanha wine in a teaspoonful of water every five or six minutes for four or five times in the day if necessary. Two days of this treatment destroys most colds, and the cure is confirmed by a grain of quinine taken dry on the tongue in the forenoon of the two or three days following.

CASTRATION OF CRIMINALS.—The following is the recommendation of an enthusiastic sociologist who proposes castration as a means of limiting crime. The good effect of this kind of punishment upon the criminal class would be four-fold.

1. No offspring with an inherited tendency to commit crime.
2. An added terror to the punishment inflicted for breaking the laws.
3. A gradual improvement in time of the morals of the public at large.
4. An improvement in the disposition of the person operated upon.—*Medical News*.

To keep postage stamps in the pocket or memorandum book without sticking, a New Orleans Post Office clerk advises people to rub the sticky side over the hair two or three times. The oil of the hair coats the mucilage and prevents it from sticking.

TO RESTORE GLOSS TO A SILK HAT.—When a silk hat becomes wet, or from other causes has lost its smoothness and gloss, cleanse it carefully from all dust, then with a silk handkerchief apply petrolatum evenly, and smooth down with the same handkerchief until it is dry, smooth, and glossy. This will make a silk hat look as good as new.

TO RELIEVE THE ITCHING IN IVY POISONING.—Dr. J. W. Little, of Washington, D. C., writes to the *Medical Record*: "Having tried everything I could think of for the intense itching caused by poison ivy, I was at a great loss to know what to do for a patient who was becoming dissatisfied. I concluded to try the following original prescription: Bromo-chloralum, ℥iv; vinum opii, ℥ij; aquæ, ℥vj. My patient was ordered to bathe the parts freely with this, and informed me that it 'acted like magic,' and relieved the itching at once. I have tried the same in other cases, and also in urticaria, with relief."

TO MAKE LABELS ADHERE TO TIN.—Take of flour six ounces, of molasses one-half a pint, and of water one pint and a half, and boil as usual for flour paste.

Or, dissolve two ounces of resin in one pint of alcohol. After the tin has been coated with the solution, allow nearly all of the alcohol to evaporate before applying the label.

TO COLOR COPPER AND NICKEL-PLATED OBJECTS.—The *Journal des Applications Electriques* says that eleven different colors may be communicated to well cleaned copper, and eight to nickel plated objects by means of the following bath:

Acetate of Lead	300 grains.
Hyposulphite of Soda	600 "
Water	1 quart.

After the salts are dissolved, the solution is heated to ebullition, and the metal is afterward immersed therein. At first, a gray color is obtained, and this, on the immersions being continued, passes to violet, and successively to maroon, red, etc., and finally to blue, which is the last color.

As the substances that enter into the composition of the solution cost but a few cents, the process is a cheap one. It is especially applicable in the manufacture of buttons.

THE LENGTH OF A STEP.—Dr. Gilles de la Tourette has recently published a monograph upon normal locomotion and the variations in the gait caused by diseases of the nervous system. He found, from a comparison of a large number of cases, that the average length of a pace is, for men, 25 inches; for women, 20 inches. The step with the right foot is somewhat longer than that with the left. The feet are separated laterally in walking about $4\frac{1}{2}$ inches in men, and about 5 inches in women. The ataxic gait is characterized by an actual shortening of the pace coinciding with an apparent lengthening, and by a considerable increase in the lateral separation of the feet.

COMBINED ANTISEPTICS.—Lépine (*Archiv. d. Pharm.*) recommends a mixture of the most active antiseptics in the following proportions: (calculated as per cent.)

Corrosive sublimate	0.000001
Salicylic acid	0.0001
Carbolic acid	0.0001
Benzoic acid	0.00005
Chloride of lime	0.000005
Bromide of quinine	0.0002
Chloroform	0.0002

He asserts that the above solution will prevent bacteria in an equal bulk of culture-broth, and that it will kill even *Bacillus subtilis*.

A CURIOUS ANÆSTHETIC.—A curious anæsthetic used by the Chinese has recently been made known by Dr. U. Lambuth, in his third annual report of the Soochow Hospital (*Provincial Medical Journal*.) It is obtained by placing a frog in a jar of flour and irritating it by prodding it. Under these circumstances it exudes a liquid which forms a paste with a portion of the flour. The paste dissolved in water was found to possess well marked anæsthetic properties. After the finger had been immersed in the liquid for a few minutes it could be pricked with a needle without any pain being felt, and numbness of the lips and tongue were produced by applying the liquid to them.

TANNIN FOR BURNS.—The ethereal solution of tannin, of syrupy consistence, is said to immediately soothe the pain of burns; it dries rapidly, and forms a pliable, non-elastic coating, which is preferable to collodion, as it does not shrink or stiffen.

An intelligent physician says: "It is a good rule always to ride up in an elevator, and when coming down to take the stairs. Like going up hill, walking up stairs is hard work, and sometimes risky, especially for people with weak lungs, defective respiratory organs, or heart disease. But going down stairs hurts nobody, but is good exercise; going down on a brisk run is really a good thing—it shakes up the anatomy, without incurring the danger of physical over-exertion. This shaking up is good for one's internal mechanism, which it accelerates, especially the liver, the kidneys, and the blood circulation."

PASTE FOR LABELS.—BY LEO ELIEL.—The formulas here presented, with samples, are not original with the writer, but have been in use by him for many years with entire satisfaction.

1. Gum tragacanth.....1 ounce.
 " arabic.....4 ounces.
 Dissolve in
 Water.....1 pint.
 Strain and add
 Thymol.....14 grains.
 Suspended in
 Glycerine.....4 ounces.
 Finally add
 Water.....to make 2 pints.

This makes a thin paste suitable for labeling bottles, wooden or tin boxes, or for any other purpose paste is ordinarily called for. It makes a good excipient for pill masses, and does nicely for emulsions. The very small percentage of thymol present is not of any consequence. This paste will keep sweet indefinitely, the thymol preventing fermentation. It will separate on standing, but a single shake will mix it sufficiently for use.

2. Rye flour.....4 ounces.
 Powd. acacia..... $\frac{1}{2}$ ounce.

Rub to a smooth paste with 8 ounces of cold water, strain through a cheese cloth, and pour into one pint of boiling water. Continue the heat until thickened to suit. When nearly cold add

- Glycerine.....1 ounce.
 Oil cloves.....20 drops.

This is suitable for tin or wooden boxes or bottles, and keeps sweet for a long time.

3. Rye flour.....4 ounces.
 Water.....1 pint.
 Nitric acid.....1 drachm.
 Carbolic acid.....10 minims.
 Oil cloves.....10 minims.
 Glycerine.....1 ounce.

Mix the flour with the water, strain through a cheese cloth, and add nitric acid. Apply heat until thickened to suit, and add other ingredients when cooling. This is suitable for bottles, tin or wooden boxes, and will not spoil.

4. Dextrine.....8 parts.
 Acetic acid.....2 parts.
 Alcohol.....2 parts.
 Water.....10 parts.

Mix dextrine, water, and acetic acid to a smooth paste, then add the alcohol. This makes a thin paste, and is well suited for labeling bottles and wooden boxes, but is not suitable for tin boxes.

MELTING POINTS OF METALS.

Metals.	Centigrade.		Fahrenheit.	
Aluminum.....	degrees	700.....	degrees	1,292
Antimony.....	"	425.....	"	797
Arsenic.....	"	185.....	"	365
Bismuth.....	"	264.....	"	507·2
Cadmium.....	"	320.....	"	608
Cobalt.....	"	1,200.....	"	2,192
Copper.....	"	1,091.....	"	1,995·8
Gold.....	"	1,381.....	"	2,485·8
Indium.....	"	176.....	"	348·8
Iron, wrought.....	"	1,530.....	"	2,786
Iron, cast.....	"	1,200.....	"	2,192
Iron, steel.....	"	1,400.....	"	2,552
Lead.....	"	334.....	"	617
Magnesium.....	"	235.....	"	455
Mercury.....	"	—40.....	"	—40
Nickel.....	"	1,600.....	"	2,912
Potassium.....	"	62.....	"	143·6
Platinum.....	"	2,600.....	"	4,712
Silver.....	"	1,040.....	"	1,904
Sodium.....	"	96.....	"	172·8
Tin.....	"	235.....	"	455
Zinc.....	"	412.....	"	773·6

SELECTED ARTICLES.

PERSEVERANCE AN IMPORTANT FACTOR.—In any line of business, the man who uses reasonable economy and has the ability to give fair management and the perseverance to hold on will, in a great majority of cases, make a success; while, on the other hand, the one who rushes into whatever he has undertaken with a spasmodic endeavor to win all at once, as a general rule wastes his energies and often fails for sheer want of perseverance. The editor of the *Industrial Gazette* has observed that the man who starts in to do a day's work, and attempts to do as much in one hour as ought to be done in two, will usually find it necessary in a short time to take a rest, and while he is resting will lose valuable time which he evidently feels that he ought to make up, adding from the spasmodic efforts he will make when he starts in to work again. But, at night, the man who works steady, but perseveringly, will be found to have accomplished the most, while usually he will also be found in a much better condition to commence again the next day.

So it is in business. One will seem to hustle around and make a considerable to-do over what he is doing, and after wasting his energies in accomplishing what, by taking a little more time, could be done

with very little effort, and then, because, as he thinks, he fails to meet the success he imagines he should, becomes discouraged and is ready to make a change to something else. This, in a majority of cases, proves a loss, and, in consequence, he does not succeed as the energy he displays would seem to warrant. Another man, while he may not make a great display of his energies at the start, will go to work more systematically, and will have better opportunities to economize, and in many cases to manage better than when he attempts to rush matters. If he will but observe, he will be ready to take advantage of any favorable circumstances that may arise. It always seems that the man who is constantly shifting about is always making a change at the wrong time, when a little perseverance would have brought him through all right. In all lines of business there are fluctuations, ups and downs, and in order to succeed we must persevere. It is when the odds seem against us that it seems the most important to persevere.

SOLDERING CAST IRON WITH TIN.—Many ornamental articles are made of cast iron, variously decorated. The smaller specimens of this kind break very easily if carelessly handled. Then the question arises of how to mend the broken article, a question that has puzzled many, as it is so very hard to firmly unite pieces of cast iron. It is hard to find a simple method, because cast iron has but a slight affinity for tin solder. The soldering can be made much easier by first cleaning the faces of the broken parts from all impurity, which is not necessary when the fracture is of recent occurrence and the broken parts are perfectly clean on their faces. With a brass wire scrubbing brush, the faces of the fracture are continually scrubbed until they finally appear perfectly yellow, thus in a certain sense being "dry plated" with brass; the rough cast iron rubs off brass from the fine wires very quickly. The brazed surfaces are tinned just as brass is tinned, and then with no greater difficulty the parts can be soldered together.—*Der Metallarbeiter.*

A CONVENIENT AND CERTAIN MODE FOR TEMPERING STEEL.—Mr. James A. Peck, of Brewsters, N. Y., mechanical engineer of the N. Y. Condensed Milk Co., gives us the following method discovered by him, and which he uses with great success for tempering all kinds of tools, knives, razors, steel dies, and other implements.

Take a suitable quantity of muriatic acid, dissolve all the zinc the acid will take.

Prepare a tempering bath composed of one part of the above zinc acid and one part water.

Heat the steel according to its hardness.

If high or hard steel, heat until just red and then temper in the acid bath.

If low steel, heat it as hot as you would to temper in water, then temper in the acid bath.

After immersing in the acid bath, cool off in water.

For lathe and planer tools draw no temper; but for other tools draw temper. Unlike water tempering, the colors that appear under this method give no clue to the hardness.

By this process, steel is readily hardened to any desired degree, and may be made to cut glass like a diamond.

If desired, an acid bath composed of two parts of muriatic acid and one part water may be used. Mr. Peck, however, prefers the zinc acid, as being more dense.

A prominent advantage of this method of tempering is the certainty and excellence of its results. It never fails to yield the temper required. It can be relied upon for every description of steel or tool.

TREATMENT OF INSECT STINGS.—The stings of insects, such as gnats, mosquitoes, etc., says *Le Pharmacien Populaire*, are often painful. In such a case apply spirit of hartshorn or volatile alkali to the part. Spider bites are not only painful, but often venomous, and it is necessary to wash them with salt water or diluted vinegar. The sting of the bee is harmful only when the sting remains sticking in the wound. So the first thing to be done is to press the wound in order to make it bleed, since the blood that flows will carry along a portion of the poison. Then suck the wound and wash it well with water and then with a solution of knos powder. This latter, which is much used in England, consists of three parts of chloride of lime to eight of common salt. An ounce of this powder is to be dissolved in a tumbler of water. If this composition is not to be had, Goulard's extract may be used. For the sting of the scorpion, volatile alkali should be used, and after the pain subsides, an emollient cataplasm may be applied.

TAKING IMPRESSIONS IN PLASTER.

BY L. P. HASKELL, D. D. S., CHICAGO, ILL.

As the success of an artificial denture depends upon a correct impression, as the foundation of the work, care should be taken to insure success.

As to materials, I differ with many instructors. While it is true that good impressions, in some cases, can be taken with wax, more still with the modelling compound, plaster yet remains the only material reliable in all cases. In the use of the other materials, it is necessary to select cases suitable for each, but if one relies upon plaster he is sure of correct results. It may be accepted as an axiom, that the more difficult the case, the greater the necessity for plaster to obtain an impression.

For a *full upper*: Spread a large napkin over the dress; select a cup as near the size of the jaw as possible; in order to obtain a high impression over the cuspids, (always a necessity,) place a little wax over the outside of the cup, at those points; also over the posterior corners, if the process is prominent, and raise the palatal surface at the rear edge, if the arch is deep.

Mix the plaster to the consistency of thick cream, and add a pinch of salt at the last moment, after the plaster is stirred, as you do not want to hasten the setting of the plaster until it is in the mouth. Stand at the right side of the chair, and with the left arm around the head of the patient, distend the lips, press the rear of the cup fully into place, and so forcing the excess forward, press the cup fully up to its place, telling the patient to keep the tongue quiet, and not be concerned about what may run over at the rear, at the same time pressing the lip so as to force the plaster well up under it. If nauseated, tell the patient to resist the tendency, as it will soon be over. When the plaster has set, which can be ascertained by breaking off a piece of the surplus in front, remove by raising the lip high and working the impression so as to let air in under it.

For a *full lower*: Proceed as above, except stand in front of the patient, and as the cup is passed into place, draw the cheek away from the cup, so as to prevent a fold of membrane under it at the rear.

For a *partial lower*, with the anterior teeth remaining: Select a cup with an opening for the teeth, and through which they will pass easily. Wet a piece of soft paper and lay over the opening, and holding the cup in the palm of the hand, fill in the plaster, and place in the mouth, always pressing the plaster away from the front, to avoid, as much as possible, having it outside of the teeth, thus facilitating removal. If there are molars remaining, and the sides of the cup will not go deep enough, place wax upon the outer edges.

In many of these cases the teeth stand in such a position that the plaster must of course break up in removal, but it matters not; only save the pieces, put them together, and a perfect impression results.

For a *partial upper*: Proceed as with a full upper, remembering to press away the plaster from the sides of the cup, when there are teeth, before inserting, as enough will go outside. In these cases *do not let the plaster set as hard* as in a full set, as the cup in such case is apt to leave the impression, and it has to be removed piecemeal, which is very unpleasant to the patient.

Never take an impression in wax, and plaster in it, for while the plaster will break away as in the other case, it will be so thin in spots as to be difficult to save the pieces, and replace them. Then there is nothing whatever gained by it.

It is a plain, simple process; only avoid using a great deal more plaster than is needed, or as large cup as in full sets.—*Ohio Journal of Dental Science.*

ARSENITE OF POTASSA.

C. J. TIBBETS, D. D. S.

Having experienced great satisfaction in the use of a formula for destroying the vitality of the pulps of teeth, I take pleasure in communicating the same to the readers of the *Archives*.

The arsenite of potassa is not found in preparations in the shops, but may be prepared in the following manner: Take 12 grs. of caustic potash, 10 grs. of arsenious acid, place in a mortar, and add a few drops of water to assist in reducing the potash and arsenic to a thick creamy paste, then add 10 grs. of sulphate of morphine (or muriate cocaine), and stir for fifteen or twenty minutes, to prevent re-crystallization. The preparation should be placed in a wide-mouthed bottle, and kept well stopped, when not in use, with a cork boiled in paraffine.

To apply the preparation, the same care should be observed as with the use of all other corrosives of its nature; the rubber dam should be applied; remove all decay from the cavity that is possible to be removed, and with a suitable instrument apply the paste directly to the exposed pulp in about the same quantity as is used of the ordinary arsenious acid and morphine preparations; cover with a small pad of cotton or blotting-paper, and seal the cavity with the gutta-percha and wax composition (which is prepared by incorporating merely enough wax with the gutta-percha to render it non-elastic.)

The arsenite of potassa may be applied to the pulp of an aching tooth, it matters not how great the congestion may be in the pulp, and in from three to twelve hours the pulp may be entirely removed. If the dressing be undisturbed for ten or twelve days, most frequently no remains of the pulp will be found, save a soapy condition of the chamber and root canals, rendering the subsequent cleansing a very easy matter.

The arsenite of potassa is especially recommended for its prompt and certain action to destroy pulps, particularly in the conditions in which pulps are found, and where pulp paste, heretofore used, rendered the attempt a matter of great uncertainty, and frequently much suffering to the patient. The arsenite of potash may be in every instance applied to congested pulps at the first visit of the patient, and no greater pain will be experienced than that which caused the visit. This prompt and immediate action of the arsenite of potassa is due to its affinity for the hydrates, fats, and albumen of the pulp tissue.—*Archives of Dentistry.*

IODOFORM AS A GERMICIDE.—About a year ago Heyn and Rovsing, two physicians of Copenhagen, startled the surgical world by announcing that they had made a series of experiments which proved that iodoform had no real power as a germicide, and that, in fact, certain bacteria would thrive in iodoform. This announcement was so inconsistent with surgical experience that it led to new investigations, which demonstrated anew the interesting and important fact that it is unsafe to generalize from the action of a remedy in chemical, or artificial physiological, apparatus as to what it will do in the tissues of the living body. It was soon found that, however iodoform might behave in test tubes and experiment flasks, it did not protect against the action of disease germs when applied to wounds of diseased surfaces. This effect is due, as De Ruyter, of Berlin, has shown, partly to the mechanical obstruction (filtration) which is afforded to the entrance of the germs without, and partly to the fact that, when in contact with the fluids of the body, it is decomposed and free iodine is liberated, which is a potent germicide. If iodoform is dissolved in ether, or in ether and alcohol, it is decomposed by the action of sunlight. Further, when such a solution is added to water, iodine is liberated and mingles with the water.

These experiments establish the value of iodoform as a dressing for wounds, and conform the results of innumerable clinical experiences. So that Surgeons may rationally continue the employment of this agent, and expect to serve in the future as in the past, as one of the most valuable aids to aseptic surgery.—*Editor Medical and Surgical Reporter.*

EUGENOL AS AN ANTISEPTIC.—Eugenol, a phenol-like compound, is insoluble in glycerine and water, and is obtained as a residue when oil of cloves is subjected to distillation with strong caustic alkalis. After the so-called light oil of cloves is distilled off, sulphuric acid or phosphoric acid is added and by continuing the distillation without access to air eugenol is obtained. Eugenol is an oily, colorless liquid, possessing the odor and taste of the oil of cloves to the highest degree. In contact with air and light it soon acquires a brown color; it boils at 247.5°C. , and has a specific gravity 1.078 at 0° and 1.063 at 18.5°C. Like phenol, which it resembles very much, it has no acid reaction, does not contain the group COOH , and also forms crystallizable compounds with alkalis. When heated by hydriodic acid, it evolves methyl iodide, and when fused with potassium hydrate, it forms protocatechuic acid; with baryta and tin dust it forms about ten per cent. methyl-eugenol. When taken internally the greater part of it is eliminated by the urine, in which, however, it cannot be detected by its odor, not by distillation, but if allowed to decompose, the characteristic odor is at

once perceptible, and when extracted with alcohol, shows the characteristic deep-green coloration with ferric chloride. Eugenol has been given in doses of three grams per day, dissolved in alcohol, and diluted in water. As an antiseptic, it is superior to phenol; as a febrifuge, it is not as efficacious as quinine, salicylic acid, antipyrin, or thaline.—*American Journal of Pharmacy.*

ARSENIC IN KILLING PULPS OF TEETH.—Arsenic will seldom produce pain if applied without morphia, and with tannin. Even if the tooth is aching at the time of its application, it will generally soothe it to death. It is sometimes desirable to precede its application with a little cotton saturated with chloroform. Morphia is an extreme irritant to a raw surface—try it on a wound or burn—and therefore instead of abating toothache caused by an exposed pulp, it increases it. The cause of pain in such a pulp is inflammation, which is not an increased flow of blood to a part, as generally supposed, but a clogging of the venous blood of a part, so that the blood cannot return through the veins with the normal freedom it is brought to the part. Tannin constricts the pulp, so that instead of the nerves being pressed by the swelling of the mass within confining walls, the whole becomes tanned and shrunken. Pain everywhere in the body is caused by pressure on the nerves, especially on their termini.

A good combination of the arsenic is: One part by weight of arsenic and two of tannin, to be made into a thin paste by one part of oil of cloves and two parts creosote. The finer the arsenic is pulverized the less is required to do the work; in fact, but an extremely small amount of the paste should be applied. Twenty-four hours is generally sufficient to devitalize the pulp; though when this very small amount is used there is little danger in its remaining longer, and generally the pulp will be found sufficiently tanned to be brought away whole. Sometimes the paste has to be applied a second time. After touching the pulp with this paste, loosely filling the cavity with cotton, and then on this drop a little sandarac varnish. Any filling which necessitates pressure on the pulp will, of course, produce pain.—*Items of Interest.*

MISFIT AND SECOND-HAND TEETH.—A firm of dentists in London advertise that they will purchase old sets of artificial teeth.

HOW HE FEELS.—Hypochondriac: "I am feeling very blue this morning." "Doctor: "What is the matter?" "Every time I feel my nose, it hurts me." "But you are not obliged to feel your nose." "But how can I tell whether it hurts unless I feel it?"—*From the German.*

CURIOSITIES OF ALLOYS.

The way in which an alloy of gold and copper or other metal is affected by a small quantity of impurity, presents one of the most serious difficulties with which our casemakers and jewelers have to deal in working gold. It has long been known to workers in the precious metal that minute quantities of certain metals render it brittle and unworkable; and referring to this, in a lecture at Birmingham, Professor Roberts-Austen, of the Royal Mint, said :

"It may be well to demonstrate the fact. Here are 200 sovereigns. I will melt them, and will add, in the form of a tiny shot, a minute portion of lead, amounting to only the 2,000th part of the mass ; first, however, pouring a little of the gold into a small ingot, which we can bend and flatten, thus proving to you that it is perfectly soft, ductile, and workable. The rest of the mass we will pour into a bar; and now that it is sufficiently cold to handle, you see that I am able to break it with my fingers, or, at least, with a slight tap of a hammer. The color of the gold is quite altered, and has become orange brown ; and experiments have shown that the tenacity of the metal—that is, the resistance of the gold to being pulled asunder—has been reduced from eighteen tons per square inch to only five tons. These essential changes in the property of the metal have been produced by the addition of a minute quantity of lead."

In the same lecture Professor Roberts-Austen said : "Here is a bar of tin, 2 ft. long and 1 in. thick, which would be most difficult to break, though it would readily bend double. If only I rub a little quicksilver on its surface, a remarkable effect will be produced—the fluid metal will penetrate the solid one, and in a few seconds the bar will, as you see, break readily, the fractured surface being white, like silver."—*Scientific American*.

PLACING GOLD CROWNS.

H. W. HOWE, LAWRENCE, KANSAS.

I have never been thoroughly satisfied with the manner in which gold crowns have been cemented to the roots. Of course we make the ferule or band fit as close as possible, even to driving it on. But when we put them home to stay, are we *sure* the enlarged nerve canal is well filled around the pin or post? Are we sure there are no air-bubbles between the root and cap? Are we sure our cement will not deteriorate at the edges of the inverted cup under the gum? Not quite sure. Well, I try to be sure that my caps and crowns are. I leave a vent-hole in the crown, but fill my cap full, as well as the stump, of

cement, before I press or drive the work home. I have my rubber dam adjusted, and put a cement of dissolved gutta-percha *around* the stump before I put the cap home for good; thereby being assured that my joint is gutta-percha instead of phosphate of zinc, which we all know is preferable. With the vent-hole for the surplus, I can use stiffer cement than I dare to without it; afterward I can fill that hole, and I am satisfied I can make better work than I can with thin cement, expecting the pressure of putting home my work to drive out the fluids through a joint I deem absolutely necessary to have so perfect. I know it is generally thought best not to have the vent, but I use it and am satisfied with it. I have never been satisfied with porcelain faced crowns (anterior teeth) until I tried making my posts into tubes, thereby allowing the surplus cement to go over and out through this hollow post when being sent home for good.

Reliable operators have told me that a pin or post attached to the crown was not to be trusted—that they would “come home to roost,” but I have the first one thus handled to give trouble. But when I used the thin cement, no vent, no gutta-percha and solid posts, I was sometimes bothered with unsatisfactory results and chagrin. With the rubber dam adjusted and the gutta-percha cement in place, root and cap filled with oxy-phosphate, I carry it to place as far as the clamp or rubber dam, quickly remove the clamp and dam with the disengaged hand, and send it home. Try it.—*Western Dental Journal*.

USEFUL RECEIPTS.

A SOLDERING FLUID.

Chloride of zinc, so much used in soldering iron, has, besides its corrosive qualities, the drawback of being unwholesome when used for soldering the iron tins employed to can fruits, vegetables, and other foods. A soldering mixture has been found which is free from these defects. It is made by mixing 1 pound of lactic acid with 1 pound of glycerine and 8 pounds of water.

BRASSING SMALL ARTICLES.

To one quart water add half an ounce each of sulphate copper and protochloride of tin. Stir the articles in the solution until the desired color is obtained. Use the sulphate of copper alone for a copper color.

TO CLEAN RUST FROM POLISHED STEEL.

Mix 10 parts of tin putty, 3 of prepared buck's horn, and 25 of spirits of wine, to a paste. Cleanse the article by rubbing with this, and finally rub off with blotting paper.

CEMENT FOR CELLULOID.

A good cement for celluloid is made from 1 part shellac dissolved in 1 part of spirit of camphor and 3 to 4 parts of 90 per cent. alcohol. The cement should be applied warm, and the broken parts securely held together until the solvent has entirely evaporated.

TO BRONZE TIN AND TIN ALLOYS.

Tin, and tin alloys, after careful cleansing from oxide and grease, are handsomely and permanently bronzed if brushed over with a solution of one part of sulphate of copper (bluestone,) and one part of sulphate of iron (copperas) in twenty parts of water. When this has dried, the surface should be brushed with a solution of one part of acetate of copper (verdigris) in acetic acid. After several applications and dryings of the last named, the surface is polished with a soft brush and bloodstone powder. The raised portions are then rubbed off with soft leather moistened with wax in turpentine, followed by a rubbing with dry leather.—*Sanitary Plumber.*

HARD RUBBER AND CORUNDUM DISCS AND WHEELS.

BY GEORGE A. MAXFIELD, D. D. S.

The Arthur discs and wheels are a combination of corundum or emery with shellac. Their softness, causing them to wear away rapidly, is their great objection. Celluloid, gutta percha and caoutchouc, in combination with the corundum or emery, have been tried in order to obviate this drawback. While for this use celluloid has many serious defects, and is no better than shellac, caoutchouc has been found to possess many advantages over both. Wheels of all sizes, from one-inch to forty-eight inches in diameter, and from one-fourth inch to six inches in thickness, made from caoutchouc combined with emery, have been used in the arts and manufactures for over twenty years. These wheels, particularly adapted for use in the dental laboratory, are superior to those which are in general use, because they cut faster and last longer.

Hard rubber and corundum discs, for use in the dental engine, can be obtained at the dental depots, but not stump-wheels made from the same material. The process of making these discs and wheels is a simple one, and every dentist has in his laboratory all the apparatus necessary for the purpose.

He describes his process. The most difficult part is the combining the caoutchouc and corundum or emery. Taking a sheet of black rubber, such as we use for making plates, it is softened over a water bath, not by dipping in hot water. When softened, one side is covered with the emery (No. 90 if for cutting, No. 100 or 120 for polishing), then folded over on itself and passed through a pair of rollers [a common clothes-wringer answers the purpose well], and this repeated until the

proper quantity of emery is worked into the rubber. Use 4 parts of emery or corundum to one part of rubber, by weight. The combination of the rubber and emery is not a chemical, but simply a mechanical one.

After the corundum and rubber are properly combined, laying the rubber on a glass slab, and with a roller made by filling a bottle with boiling water, roll it to the thickness necessary for discs and wheels,* and with the same cutters used for cutting sand-paper discs, cut out the discs or wheels.

From scraps from the tin shop may be cut discs of tin plate somewhat larger, and stringing the corundum-rubber discs and tin-plates alternately on a wire the size of the screw of the mandrel used in the engine, clamp them together. For this purpose he uses two square pieces of brass plate about one-eighth inch in thickness, with four holes in each for as many bolts, and screw them only tight enough to make a pressure. They are now ready for the vulcanizer, and are vulcanized the same as a dental plate. As soon as removed from the vulcanizer, drawing out the wire, as it is more easily removed when hot, cool as rapidly as you wish, and when cold there is no trouble in separating the discs.

If hubs on the discs are desired, take a number of pieces of brass plate, say about three-sixteenths of an inch thick, drill the hole for the wire, and countersink each side the size you wish the hub. By countersinking both sides you will need only half as many brass pieces, as the tin plate can be used on the flat sides of the discs. To prevent them adhering to the brass, place a piece of tin-foil between the disc and brass. After the discs and wheels are vulcanized, true them up by placing them on the mandrel in the engine, and while running it, warm the edge of the disc in a flame of gas or alcohol till it softens, then run it against a piece of glass or porcelain. To make the stub-wheels roll thicker than the discs. Discs and wheels of different thickness can be vulcanized at the same time, but to vulcanize discs or wheels of different diameters it will be necessary to use heavier plates between them. Large wheels for laboratory use can be made in the same way as small ones.

Discs and wheels for polishing fillings and teeth can also be made from vulcanite or soft rubber, and as the rubber for dental plates becomes hard rubber when vulcanized, it will be necessary to have a special rubber, one containing less sulphur, for this purpose, as the amount of sulphur added to the caoutchouc, and the length of time vulcanized, constitute the difference after vulcanization, between hard rubber and vulcanite or soft rubber.—*Independent Practitioner.*

* To prevent the corundum-rubber adhering to the roller, dust a little of the corundum or emery over the surface.

CREDIT.

By an oversight in our last issue, due acknowledgement to the New York *Medical Record* for their kindness in sending us proof-sheets of their report of the proceedings of the late International Medical Congress, was omitted. We desire to return our thanks for them, feeling that their generosity towards their brethren of the medical and dental press, should not be forgotten.

A MOSAIC OF THE DEAD.

In the Pitti Palace at Florence, says the London *Figaro*, is a table made by Giuseppe Sagatti, which, to the casual observer, gives the impression of a curious mosaic of marbles of different shades and colors, for it looks like polished stone. In reality, it is composed of human muscles and viscera. No less than a hundred bodies were required for the material. The table is round, and about a yard in diameter, with a pedestal and four claw feet, the whole being formed of petrified human remains. The ornaments of the pedestal are made from the intestines, the claws with hearts, livers and lungs, the natural color of which is preserved. The table top is constructed of muscles artistically arranged, and it is bordered with upward of a hundred eyes, the effect of which is said to be highly artistic, since they retain all their luster and seem to follow the observer. Sagatti died about fifty years ago. He obtained his bodies from the hospitals, and petrified them by impregnation with mineral salts. An Englishman in Cabul writes to the *Liverpool Mercury* that he saw there a curious piece of architecture the other day, a ghastly, triumphal arch made by artisans of the place with the heads of two hundred prisoners taken in the rebellion.

KANSAS STATE DENTAL ASSOCIATION.

The Kansas State Dental Association meets at Topeka, last Tuesday in April, 1888.

A. B. Gunn, Secretary,
Leavenworth, Kansas.

ALABAMA DENTAL ASSOCIATION.

The next meeting of the Alabama Dental Association will be held at Selma, Alabama, commencing on Tuesday April 10, 1888, the sessions to continue four days. All dentists are cordially invited to be present.

T. M. Allen, D. D. S., Secretary,
Birmingham, Alabama.

SOUTHERN ILLINOIS DENTAL SOCIETY.

The second annual meeting of the Southern Illinois Dental Society, will be held in Centralia, on Tuesday and Wednesday, April 10 and 11, 1888.

A good programme is promised, and we urge, especially Southern Illinois brethren, to be on hand. A cordial invitation is extended to the profession in general.

G. W. Entsminger, Secretary,
Carbondale, Illinois.

ILLINOIS STATE DENTAL SOCIETY.

The twenty-fourth annual meeting of Illinois State Dental Society, will be held at Cairo, beginning Tuesday, May 8, 1888, the sessions to continue for four days.

An excellent programme has been arranged, with clinics as a special feature. A cordial invitation is extended to the profession to be present.

Garrett Newkirk, Secretary,
1558 Wabash Ave., Chicago.

UNIVERSITY OF CALIFORNIA.

COLLEGE OF DENTISTRY.

The exercises of the sixth annual commencement of the College of Dentistry of the University of California, were held at Odd Fellows Hall, San Francisco, California, November 9, 1887, at 8 o'clock P. M.

The address for the faculty was delivered by L. L. Dunbar, D. D. S.

The degree of D. D. S. was conferred upon the members of graduating class by E. S. Holden, L. L. D., President of the University.

The number of Matriculates for the session was thirty-six.

The following is the Graduating Class :

Edward Livingston Davis, Cal.	Arthur Theo. Regensburger, Cal.
Joseph Depuy Hodgen, "	George Frederick Rodden, "
Harold McKean Jones, "	George Walter Rodolph, "
Edward Maldonado, Nevada.	Granville Eugene Shuey, "
Robert Eugene Payne, Cal.	Jennie Martha Simpson, "
Charles Edgar Post, "	Otto Frank Westphal, "

LITERARY NOTES.

IRREGULARITIES OF THE TEETH AND THEIR TREATMENT. By Eugene S. Talbot, M. D., D. D. S. Professor of Dental Surgery in the Woman's Medical College; Lecturer on Dental Pathology and Surgery in the Rush Medical College, Chicago. With 152 Illustrations. Published by P. Blakiston, Son & Co., 1012 Walnut St., Phila., Pa., 1888. Price \$2.00.

The above work is presented with the usual neat typographical excellence of the publishers. It is divided into two parts "Anatomy"—and the "Treatment of Irregularities." These subjects are ably handled by the author, who gives for the elucidation of the subject numerous well executed wood cuts, without which, this interesting department of Dental Surgery would be robbed of much of its interest and fascination.

We commend the work to every practicing Dentist, as a valuable adjunct, and a book of reference on this subject to his library.

THE INDEPENDENT PRACTITIONER. This ably conducted, original, independent and well edited monthly, comes to us at the commencement of the new year with all the vigor of the Past, and every indication of a more vigorous life for the Future inscribed on its pages.

We congratulate its *editor* on the position he has won for his journal, and the *profession of dentistry* in the possession of a medium which knows no clique, party or society; but whose aim, in the dental signification, is "pro bono publico."

Let us hope it will long be sustained by the profession, in whose interests it is published, for the many points of excellence it exhibits, as well as for the fact of its being independent in the expression of its views.

To make the publication even more acceptable to all dentists, its editor has entered into an arrangement with Prof. C. H. Stowell, of Ann Arbor, Mich., whose magnificent work, "The Microscopic Structure of a Human Tooth," (published and sold originally at six dollars per copy,) is offered to the subscribers of the Independent Practitioner at four dollars; that is, the journal will be supplied for *one year* and a copy of the "Microscopic Structure of a Human Tooth," for Four dollars. This offer is made solely to the subscribers of the Independent Practitioner. When ordered by *mail*, 25 cents extra will be required for the payment of postage on the work.

1000 FINE

JOHNSON & LUND'S
DOUBLY REFINED

EXTRA TOUGH GOLD FOIL.

PHILADELPHIA 620 RACE ST. **DENTAL DEPOTS** CHICAGO 514 WABASH AVE

COHESIVE. EXTRA COHESIVE.

SOFT OR SEMI-COHESIVE.

Each Grade Uniform in Quality. Does not Ball up under the plugger. Its absolute purity is unquestioned.

Nos. 3 to 240.

Works with the utmost smoothness. Exhibits great softness under the burnisher. Possesses a wonderful amount of durability and toughness.

PRICE.

Per $\frac{1}{8}$ ounce,	-	-	\$4.00	Per $\frac{1}{2}$ ounce,	-	-	\$15.00
" $\frac{1}{4}$ "	-	-	7.75	" 1 "	-	-	30.00

Steurer's Plastic Gold.

We respectfully call attention to a new form of **Dental Gold**, that we have introduced to the profession under the name of "STEURER'S PLASTIC GOLD."

It is a chemically pure Gold in a plastic state, without admixture of any foreign substance, of a brown color and homogeneous appearance.

We claim the following advantages over all other forms of Gold heretofore used:—

1st. It is more cohesive.

2nd. It has a spreading quality before it is completely condensed, so that it can be moulded into any cavity.

3rd. A tooth can be filled in one-third of the time it takes with any other Gold, simple hand pressure being sufficient to make a solid filling, the mallet (which is so disagreeable to most patients) can be dispensed with, and sensitive teeth, or those whose walls are frail, can be easily filled.

Beware of worthless imitations. Be careful to see that it is in the shape of small square pieces, packed in bottles, and labeled *Steurer's Plastic Gold*, because the imitations, although they may apparently work tolerably in the commencement, do not make a solid filling, but gradually crumble away.

AS WE HAVE TO PAY CASH FOR THE GOLD AND THE MARGIN
IS SO SMALL, WE MUST SELL FOR CASH ONLY.
PLEASE SEND CASH WITH ORDER.

Price Per Bottle, 1-16 oz., \$2.50. Sent postage free on receipt of price.

JOHNSON & LUND,

DENTAL DEPOTS.

620 Race Street, Philadelphia.

514 Wabash Avenue, Chicago.

1,000 FINE

Extra Tough Gold Pellets.

Nos. 1-4, 1-2, 3-4, 1, 1 1-2, 2, and assorted.

\$4.00 per $\frac{1}{8}$ ounce.

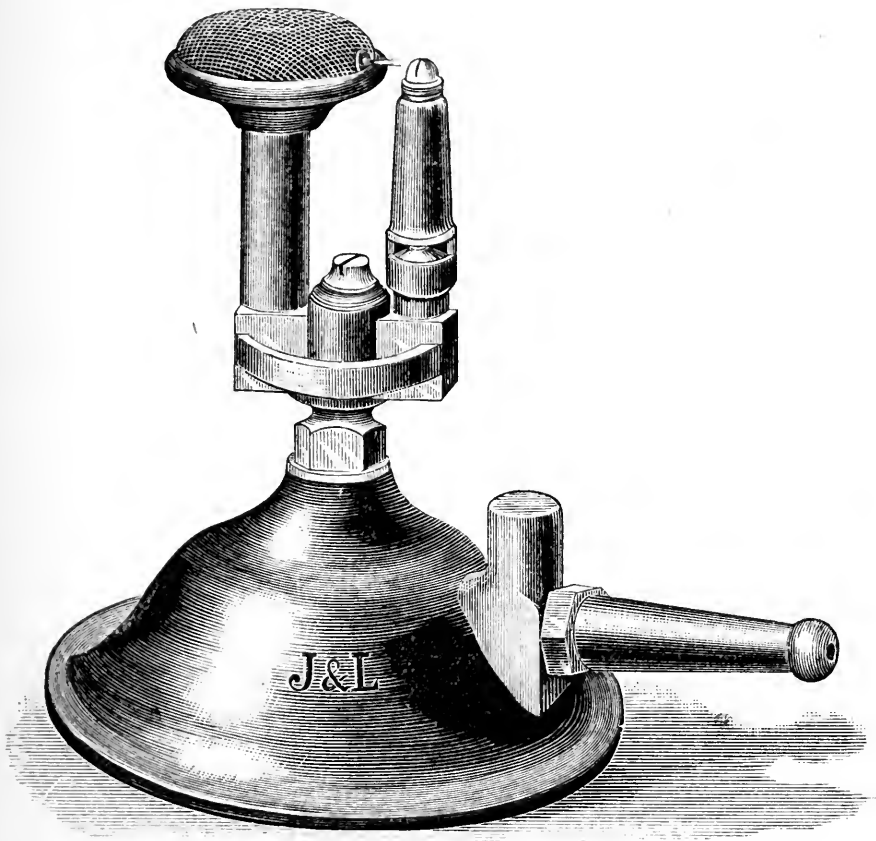
\$30.00 per ounce.

JOHNSON & LUND,

620 Race Street, Philadelphia.

514 Wabash Avenue, Chicago.

THE DUPLEX BURNER.



Very convenient for laboratory use, consisting of an ordinary illuminating burner and a large flame for the blow-pipe. These burners can be ignited alternately by rotating the upper portion upon the base. There is also a small jet which, when once lighted, ignites either flame, without being extinguished itself. By removing the tip from the illuminating burner, a flame suitable for waxing up and other purposes may be obtained. After being once lighted, the Duplex Burner is always ready for use.

Price, - - - - - - - \$1.50

JOHNSON & LUND,

620 Race St., Philadelphia.

514 Wabash Ave., Chicago.

WATTS' **CRYSTAL GOLD.**

\$4.00 per one-eighth ounce.

JOHNSON & LUND,

Philadelphia and Chicago.

NERVE BROACHES

THE BEST

Assorted Sizes.

75 CENTS PER DOZEN.

NERVE PASTE.

Arsenic and Creosote.

35 Cents per Bottle.

SPUNK.

FOR DRYING OUT CAVITIES.

Price per oz..... 20

" in bulk, per lb.... \$1.25

SEPARATING FILES.

*J. M. EARNEST'S MAKE ARE THE VERY
BEST WITHOUT DOUBT.*

No. 000, per dozen..... \$1.25

All other numbers, per dozen. 1.00

JOHNSON & LUND.

THERMOMETERS.

For Vulcanizers.

THE MOST RELIABLE.

75 CENTS EACH.

PHENOL SODIQUE.

50 Cents per Bottle.

FLASKS FOR

VULCANIZING

Malleable Iron, Each..... .75

Brass..... \$1.50

Orange Wood for Wedging.

Per bundle, 10 Cts.

DENTAL FLOSS SILK.

Price, plain, per dozen, . . 90

" " " spool, . . 10

Price, waxed, per dozen, . \$1.50

" " " spool, . 15

JOHNSON & LUND, Philadelphia and Chicago.

REDUCTION IN PRICE.

FRENCH

Separating Files.

" FROIDS."

Per dozen..... \$1.00

Shellac Sticks,

FOR

MOUNTING DISKS.

Per box..... 25c.

MEDICINE BOTTLES.

A small square glass bottle, with ground glass stopper, for Office Preparations. The stopper is flat on top to receive a label.

Per dozen..... 80 c.

Each..... 07 c.

It Retains its Brightness.

It works with great Plasticity, and packs densely.

Oz. Troy.

Extra Amalgam.

GOLD AND

JOHNSON & LUND
LABOR OMNIA VINCIT.

PLATINA ALLOY.

TRADE MARK.

JOHNSON & LUND.

SOLE PROPRIETORS,
620 RACE ST., PHILADELPHIA.
514 WABASH AVE., CHICAGO.

It possesses the greatest possible freedom from shrinkage.

Impervious to the Secretions of the Mouth.

PRICES.

One	Ounce Package	\$ 3.00
Two-thirds	" "	2.00
One-third	" "	1.00
Two Ounces, purchased at one time	. . . . .	5.40
Three "	" " " "	7.65
Four "	" " " "	9.75
Five "	" " " "	11.75
Ten "	" " " "	20.00

When money accompanies the order, the Amalgam will be sent postage free.

REDUCTION IN PRICE.

RUBBER BOWL FOR MIXING PLASTER.



These bowls are made of soft rubber, almost one-eighth of an inch thick. They cannot be broken. Their sides can be pressed together so as to form a lip or spout for pouring out soft plaster. The plaster that remains in them and becomes set can be thoroughly crushed and removed by squeezing the sides of the bowl together.

Inside measurement, $4\frac{1}{4}$ inches in diameter by $3\frac{1}{8}$ inches in depth.

PRICE, 60 CENTS EACH.

POSSESSES THE GREATEST FREEDOM FROM SHRINKAGE.

IT RETAINS ITS BRIGHTNESS.



oz. Troy.
**EXTRA TOUGH
GOLD
AND
PLATINA ALLOY**

A notable Tooth Saver.

The proportions of Gold and Platina in this Alloy with the Combination of Silver, Tin, &c., cause it to harden quickly and to maintain its edge strength. Use as little Mercury as will make a stiff plastic filling, and place in cavity without washing.

JOHNSON & LUND,

SOLE AGENTS,

620 Race St., Philada.

514 Wabash Ave., Chicago.

WORKS WITH GREAT PLASTICITY AND PACKS DENSELY.

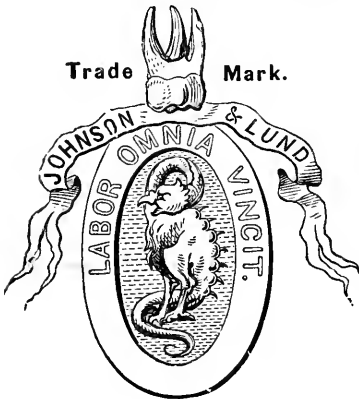
IMPERVIOUS to the SECRETIONS of the MOUTH.

PRICES.

Per ounce	\$3.00
" half ounce	1.50
" two ounces purchased at one time	5.40
" three " " "	7.65
" four " " "	9.75
" five " " "	11.75
" ten " " "	20.00

When money accompanies the order, the Amalgam will be sent postage free.

Virgin White Alloy for Front Teeth.



The prominent qualities of this alloy are its WHITENESS and FREEDOM FROM SHRINKAGE. Fillings made of this Amalgam, in tubes five or six times the diameter of those usually employed in the "leakage test," with blue or purple ink, give no perceptible indications of permeation of fluid. Though designed especially for front teeth, yet it will stand mastication well anywhere in the mouth. For crown cavities, however, we recommend the EXTRA TOUGH GOLD AND PLATINA ALLOY, as that is made with special regard to edge-strength.

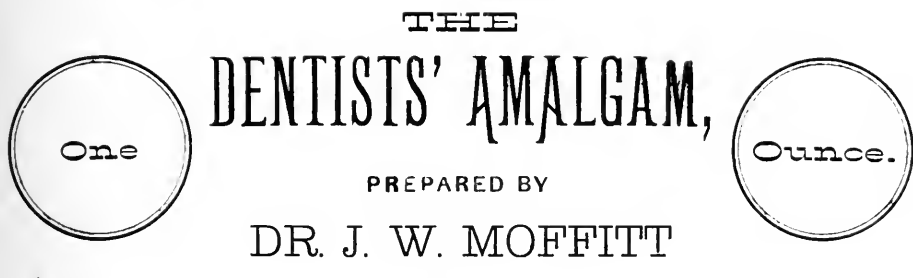
PRICES.

Per ounce	\$2.00
" half ounce	1.00
" two ounces purchased at one time	3.80
" three " " "	5.40
" four " " "	6.80
" five " " "	8.00
" ten " " "	15.00

When money accompanies the order, the Amalgam will be sent postage free.

Dentists' Amalgam.

"Those things called dear are, when justly estimated, the cheapest."



It is composed of pure metals only. It contains no Cadmium or Bismuth. It will not discolor the teeth, or shrink from the cavity walls. In a word, it will not EXPAND, CONTRACT, or OXIDIZE. It requires LESS MERCURY in the process of Amalgamation than any other. For TOUGHNESS, STRENGTH and RESISTANCE it has no equal.

Price, per Ounce,	-	-	-	-	\$5.00
" " Half Ounce,	-	-	-	-	2.50
" " Quarter Ounce,	-	-	-	-	1.25

"Prove all things, and hold fast to that which is good."

Metals, such as Cadmium and Bismuth, are not used in the manufacture of the DENTISTS' AMALGAM. This secures to the purchaser a greater bulk per ounce than in other Alloys.

This Amalgam having been thoroughly tested during the past quarter of a century and approved by the best practitioners, we deem it unnecessary to offer any of the numerous testimonials we have to sustain its already well-earned reputation.

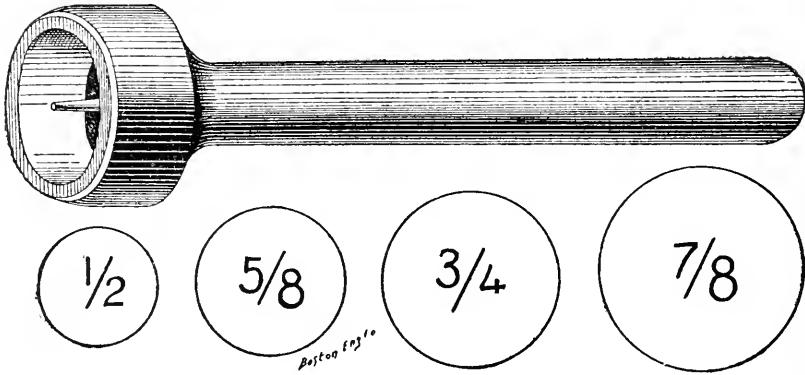
JOHNSON & LUND,

620 Race Street, Philadelphia.

514 Wabash Avenue, Chicago.

DISK CUTTERS.

Suggested by Dr. S. G. Stevens.



Every Dentist can cut his own and Paper, Emery Paper, or Em Cloth Disks, if he has one of these Cutters.

PRICE, EITHER SIZE, EACH, \$1.00

JOHNSON & LUND,

620 Race Street, Philadelphia.

514 Wabash Ave., Chicago.

DENTAL FLOSS SILK.

We offer the Best Dental Floss Silk in the Market—full length, 12 yards on a Spool, at the following low rates :

	PER HALF GROSS.	PER DOZEN.	PER SPOOL.
Price, Plain, . . .	\$3.75	\$0.75	\$0.08
“ Waxed, . . .	7.50	1.50	15

JOHNSON & LUND,

620 Race Street, Philadelphia.

514 Wabash Ave., Chicago.

KNOXVILLE DENTAL DEPOT,

NO. 11 ASYLUM STREET, KNOXVILLE, TENN.

Where may be found a complete Assortment of Dental Supplies. I keep all
Dental Goods and Instruments made and Handled by

Johnson & Lund,

M. M. HARRIS, Proprietor.

JAMES M. EARNEST,

MANUFACTURER OF

Dentists' Files'

OF ALL DESCRIPTIONS.

NO. 2121 SARGEANT STREET, PHILADELPHIA.

Oct. 1888.

Birmingham, Ala., Dental Depot

197½ FIRST AVENUE,

T. M. ALLEN, D. D. S., Proprietor.

Has constantly on hand a large stock of Johnson & Lund's Improved Artificial
Teeth, Extra Tough Rubber, Extra Amalgams, Onyx Cement, Lathes, Vulcanizers,
Impression Cups, &c., &c.

N. B.—Special attention given to selecting teeth, when samples and models are
furnished.

CHAS. ABBEY & SONS,

DENTISTS' FINE GOLD FOIL,

SOFT, OR NON-ADHESIVE, AND ADHESIVE.

ALL FROM ABSOLUTELY PURE GOLD.



230 Pear Street, Philadelphia.

January, 1889.

Jacksonville, Florida, Dental Depot,

No. 19 East Bay Street.

A. P. FRIES & CO., PROPRIETORS.

Dealers in JOHNSON & LUND's Improved Teeth, Extra Tough Rubber, Crimson Brown Rubber, Jet Black Rubber, Light and Dark Red Rubber, Extra Amalgam, Onyx Cement, Johnson & Lund's Lathes, Vulcanizer Impression Cups, and a full line of Dental Goods generally.

Before purchasing elsewhere give them a call.

TWILLED RUBBER DAM.

A MOST EXCELLENT ARTICLE.

Highly prized by many on account of its twilled surface.

This Dam is only made 30 inches wide.

Thin, per yard,	.	.	.	.	\$1.00
Medium, "	.	.	.	.	1.50
Thick "	.	.	.	.	2.00

JOHNSON & LUND,

620 RACE ST., PHILA.

514 WABASH AVE., CHICAGO.

M. A. SPENCER & CO.,

195 AND 197 W. SEVENTH STREET,

CINCINNATI, OHIO.

DEALERS IN

Artificial Teeth and all Varieties of Dental Goods.

RUBBER DAM IN TINS.

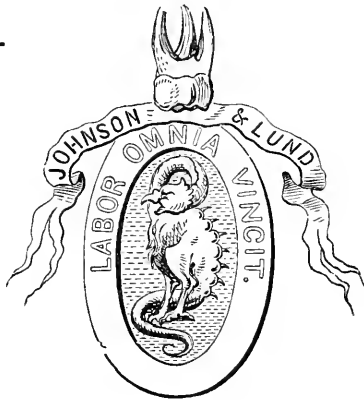
1-2 Pound, \$1.50.

Extra Tough Coffer-Dam Rubber.

Packed in

Tin Cans.

TRADE



MARK.

Manufactured expressly for

JOHNSON & LUND,

620 RACE ST., PHILA.

514 WABASH AVE., CHICAGO.

We take pleasure in calling the attention of the profession to a new article of Rubber Dam, made in the most careful manner of the best Para Rubber, no adulteration being used in the manufacture, the Dam consisting entirely of Rubber, sufficient of sulphur only being used to properly vulcanize it. It is cut in strips $8\frac{1}{2}$ inches wide and from $3\frac{1}{2}$ to 4 yards long, being a very handy size for general use. It is packed in METAL TUBES, with a MOVABLE LID made as nearly AIR-TIGHT as possible, in which the Dam can be kept, thus assisting very materially in preserving the strength of the material.

		Price.		
Per can containing $\frac{1}{2}$ lb.	Thin	.....	per yard,	\$1.00
" "	Medium	.....	"	1.50
" "	Thick	.....	"	2.00

Sent Postage Free on receipt of price.

Rubber Dam by the Yard.

35 Inches Wide. There is none made wider.

The Best Coffer-Dam Rubber.

Impossible to make any better. 35 inches wide.

The above Rubber Dam is made especially for us and to our own particular order, so that we know just what we offer to the profession, and what we know is, that it is impossible to make any better. Some time since we were obliged to buy some Coffer-Dam Rubber, which was advertised as a VERY SUPERIOR ARTICLE to supply a customer who was impressed with the advertisement of the same. The result was that he found it tender, and returned it to us unfit to be used. We replaced it with our own, with which he was very well satisfied.

Thin	.....	per yard,	\$1.00
Medium	.....	"	1.50
Thick	.....	"	2.00

CAUTION.

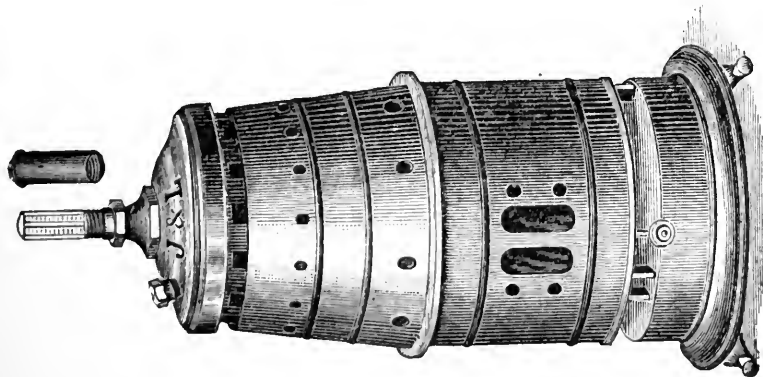
Much of the Coffer-Dam Rubber advertised by other depots and offered by their travelers is but $26\frac{1}{2}$ inches wide, is 20 per cent. less material to the yard than ours. For instance, our Medium 35 inch wide at \$1.50 per yard is as cheap as $26\frac{1}{4}$ inch of equal quality would be at \$1.12½ per yard.

JOHNSON & LUND,

620 Race St., Philada.

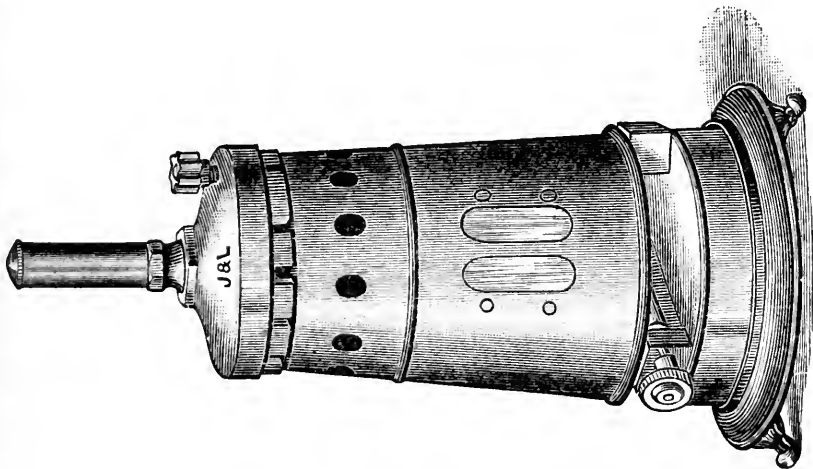
514 Wabash Ave., Chicago.

IMPROVED VULCANIZERS, MERCURY BATH, BRASS FLASKS, ETC.



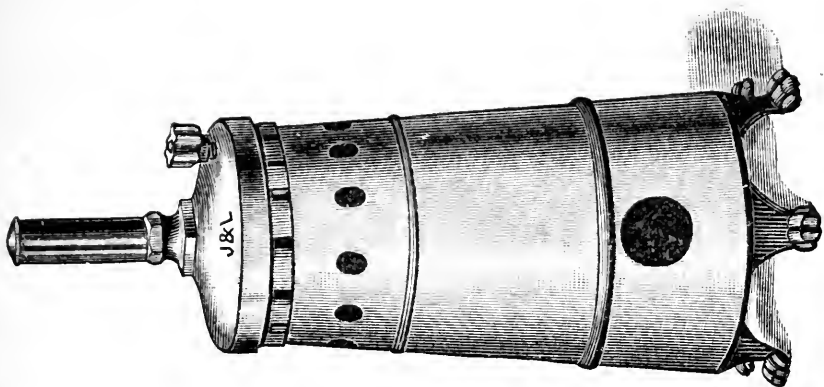
OUTFIT A.

Rigged for kerosene with Union stove.
One-case complete with Anchor Flasks, etc. \$14.00
Two-case ditto 15.00
Three-case ditto 16.00



OUTFIT B.

Rigged for kerosene with new attachment.
One-case complete with Anchor Flasks, etc. \$13.00
Two-case ditto 14.00
Three-case ditto 15.00



OUTFIT C.

Rigged for gas or alcohol.
One-case complete with Anchor Flasks, etc. \$13.00
Two-case ditto 14.00
Three-case ditto 15.00

Improved Vulcanizers, Mercury Bath, Brass Flasks, Etc.

These vulcanizers are made in the general style of the "Whitney." The boilers are of extra thick copper, and made much wider than those in ordinary use. The inside diameter of the JOHNSON & LUND Vulcanizer measures fully $4\frac{1}{4}$ inches, while the "Whitney" and "Hayes" measure but 4 inches. The great advantage of this increased diameter will be appreciated at a glance, as it enables the dentist to use the largest size of flasks when necessity demands it. That the profession may be thoroughly satisfied of the ample strength of these vulcanizers, we assure them that each boiler has been tested by and sustained a hydrostatic pressure of 500 lbs. to the square inch; and as the elastic force per lb. to the square inch at 320° Fahrenheit (the degree at which dental plates are generally vulcanized), is but 88 lbs., our Vulcanizers are capable of resisting more than six times the strain required. But this liberality of resisting power is no excuse for carelessness on the part of the operator.

Johnson & Lund's Improved Vulcanizers are furnished with thermometer, mercury bath, one packing in place and an extra piece, extra disks for the safety-valve, requisite number of wrenches, malleable iron or brass flasks at option of purchaser. When no flasks are mentioned the brass ones will always be sent with the apparatus. We especially call attention to the flasks furnished with these Vulcanizers. They are of the pattern known as the **ANCHOR FLASKS**. Owing to their peculiar formation, an extra amount of room is afforded for the case to be vulcanized, and the bolts can be detached and replaced with great facility, without removing the screw from the nut.

WU

Donham's Spring Pressure fitted to a Vulcanizer, adds \$1.25 to the Price.

One-case Vulcanizer, copper boiler, furnished with thermometer, packing jacket, lamp, disks for safety-valve, two flasks (either malleable iron or brass, at the option of the purchaser), and wrenches—complete for alcohol Ditto—complete for gas
Ditto—complete for kerosene
Two-Case complete for gas
 " complete for alcohol
 " complete for kerosene
Three-Case Vulcanizer—complete for gas
 " —complete for alcohol
 " —complete for kerosene
If the stove part is furnished with the kerosene burner, when sold in connection with the Vulcanizer, there will be an extra charge of

NOTE.—The kerosene burner we are now furnishing with our Vulcanizer has but one burner; but that burner is four inches wide, instead of only two inches wide, which is the size of the burner belonging to the No. 1 Union Stove. This increased size makes the new burner equal to the two-burner stove, and at no increased expense.

No. 1 Union Kerosene Stove, with one burner two inches wide	\$2 00
" " " four inches wide	2 25
No. 2 " " two burners each two inches wide	3 00
Vulcan Gas Stove	1 50

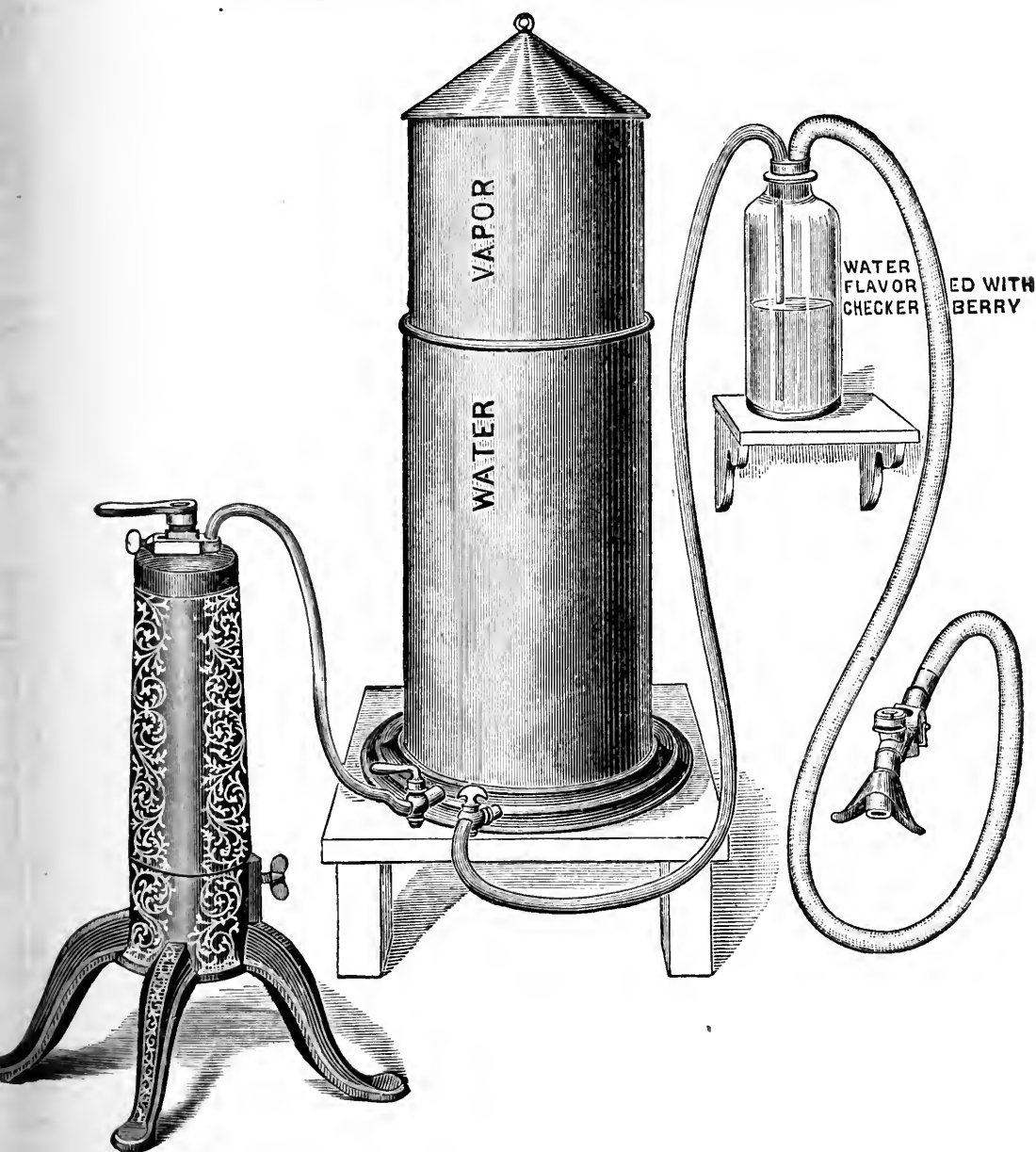
NORX — We make no allowance where Vulcanizers with malleable iron flasks are ordered instead of brass ones.

Two-Case Boiler, cover, thermometer, wrenches .	\$10 50	Round Wrench for Boiler	25	Felt Wicks for Union Kerosene Stove, 4 in. per doz.	\$1 00
Three-Case " " " " " " " " " " " "	11 50	Straight " " " " " " " " " " " "	25	Endless Packing, for J & L's Vulcanizer, each	05
Two-Case Boiler, without cover and thermometer	6 00	Flask Wrench	10	" " " " " " " " " " " "	60
Three-Case " " " " " " " " " " " "	7 00	Raised Bed-Plate	\$1 00	Ordinary " " Whitney " " " "	05
Thermometer-Case and Tube, complete	2 00	Bed-Plate and Wrench	50	" " " " " " " " " " " "	60
Outside Thermometer-Case	50	" " " " " " " " " " " "	25	" " " " " " " " " " " "	10
Inside " " " " " " " " " " " "	50	Wrench, double end	25	Alcohol Lamp, for Vulcanizer	60
Cover, with Thermometer-Case and Thermometer	7 00	Felt Wicks for Union Kerosene Stove, 2 in. each.	05	Jackets	35
" " " " " " " " " " " "	5 00	" " " " " " " " " " " "	10	Thermometers, each	75
New Ring to Boiler	2 00	Canvas Wicks for Union Kerosene Stoves, 4 in each	06	Base, for either alcohol or gas	25
" " Bottom to Boiler	2 00	" " " " " " " " " " " "	60	Gas Burner for Vulcanizer	60
" " " " " " " " " " " "	2 00	Felt Wicks for Union Kerosene Stove, 2 in. per doz.	60		

A New Discovery. A New Discovery.

FAR SUPERIOR TO LIQUID NITROUS OXIDE!

The Vegetable Anæsthetic.



It is without any of the objectionable features peculiar to other Anæsthetics. On the contrary, it builds up the tissues, quickens the circulation, and adds oxygen to the system. The properties of the herbs from which it is manufactured are hypnotic, diaphoretic, stimulative, and anti-spasmodic. The patient awakens from the sleep refreshed and cheerful, and reports the sensations and effects as most agreeable. It is given to the youngest children, the most sensitive persons, as well as the aged and enfeebled, and no injury has resulted, or in the nature of the Anæsthetic can result from its inhalation.

As an assurance of the safety and perfect reliability of this new Vapor, we publish the following recommendation from physicians and dentists who have been and are now using the new Vegetable Anæsthetic:

"We have used the Vegetable Anæsthetic since January, 1886—over a year—*exclusively* in our practice, both for the extraction of teeth and minor operations in surgery. We have administered it repeatedly in heart disease, severe lung diseases, Bright's diseases, etc., etc., where the patients were so feeble as to require assistance in walking, many of them under medical treatment, and the results have been all we could ask. No irritation, suffocation nor depression, and so pleasant to inhale—in fact, from its many good qualities, we can heartily recommend it to all as the Anæsthetic of the age, and should very much regret going back to the use of nitrous oxide gas and ether.

FRIZZEL & WILLIAMS, Dentists,
Lee Hall, Lynn, Mass.

The apparatus consists of a cylinder, gasometer, inhaling bottle and inhaler, together with the different sizes of rubber tubing necessary. The advantages of a gasometer over a gas-bag must be self-apparent. The Vapor left in a bag after an operation soon evaporates; but it will remain in a gasometer an indefinite time. It is much more convenient and always ready.

The bottle acts as an indicator, likewise a stop-valve. No vapor can escape through the water until inhaled, and should the patient stop inhaling, it is at once detected, as the faintest inhalation causes the water to bubble.

DIRECTIONS.—Fill the tank to within a few inches of the top with water; balance the upper part of gasometer so that a faint bubble will be forced from the water in the bottle. Fill the bottle with water sufficient to cover the end of long glass tube, and flavor slightly with checkerberry; change the water—say every 100 gallons of vapor used.

PRICES:

Gasometer, with double wall and spigot for waste water.....	\$13 00
100 gallon Cylinder, empty.....	10 00
200 " " ".....	10 00
500 " " ".....	22 00
100 Gals. Vapor. 5c. per gal.....	5 00
200 " " 4c.	8 00
500 " " ".....	17 50
Connection.....	1 00
Indicator and Safety Bottle.....	2 00
Inhaler, Improved.....	10 00
Rubber Face Piece.....	1 00
Small Rubber Tubing.....	per foot 16
Medium ".....	25
Large Size.....	35
Tripod for 100-gal. cylinder.....	4 00
" " 200-gal. ".....	5 00
1 oz. Checkerberry.....	50
Boxing Extra.....	

Analysis of Vapor made by James F. Babcock, Analytical and Consulting Chemist, State Assayer and Inspector of Liquors, late Professor of Chemistry in Boston University and Massachusetts College of Pharmacy.

VEGETABLE ANÆSTHETIC Co.:

Gentlemen—I have made a chemical analysis of a cylinder containing one hundred gallons of the Anæsthetic manufactured by your Company, and find that the same consists of a basis of nitrous oxide, combined with the volatile active principles of several well-known vegetable anodynes and sedatives, which are calculated to increase its efficiency. I find the Anæsthetic to be free from *chloroform* (which has sometimes been detected in compressed gas), and that it is likewise free from any dangerous or objectionable constituents. I cheerfully recommend this Anæsthetic to dentists and others as worthy of general confidence.

Respectfully,

JAMES F. BABCOCK.

FOR SALE BY

JOHNSON & LUND,

620 RACE ST., PHILADA.

514 WABASH AVE., CHICAGO.

JOHNSON & LUND'S

Improved Dental Lathe, No. 1.



In the construction of this Lathe we have introduced several novelties which only need to be seen to be appreciated. In the first place, one end of the spindle is made with a split-chuck and collar, which admits of the mandrels being changed with great facility, and insures their running true. The other end of the spindle is made taper to carry brush

wheels, felt wheels, &c. In the next place, the table, which is made of solid walnut and fitted with two drawers, extends about $1\frac{1}{2}$ inches further in the rear of the head than it does in front of it,—thus furnishing the dentist or operator with a sufficiency of table room upon which to lay articles that it is desirable to have at hand. The driving-wheel is fifteen inches in diameter, and weighs 24 pounds. This great weight and enlarged diameter, in combination with the small size of the pulley, assures its running with great ease, power, and rapidity.

The column of the Lathe, being hollow, permits of the Lathe rising and falling over six inches,—thus allowing the cord to be tightened without taking it off. Accompanying the Lathe will be found three mandrels, fitted with screws and brass shoulders, one for each size of the threads fitted in Johnson & Lund's Improved Metallic Centre Corundum Wheels. There are also three brass chucks which screw on to one of the mandrels, for using with corundum wheels made without metal centres.

The Lathe is neatly painted and gilded, and is so beautifully modeled that it is quite an addition to the operating room, when it is desirable to use it in such a position. The Lathe is so constructed that it can be taken apart and packed in a very small compass. The spindle is fitted with an appliance to take up any lost motion.

For cuts of chucks and mandrels belonging to this Lathe see page 22 of adv. and note at foot of same page.

—o—

Price Complete, with Mandrels and Chucks, boxed, \$17.00.

JOHNSON & LUND

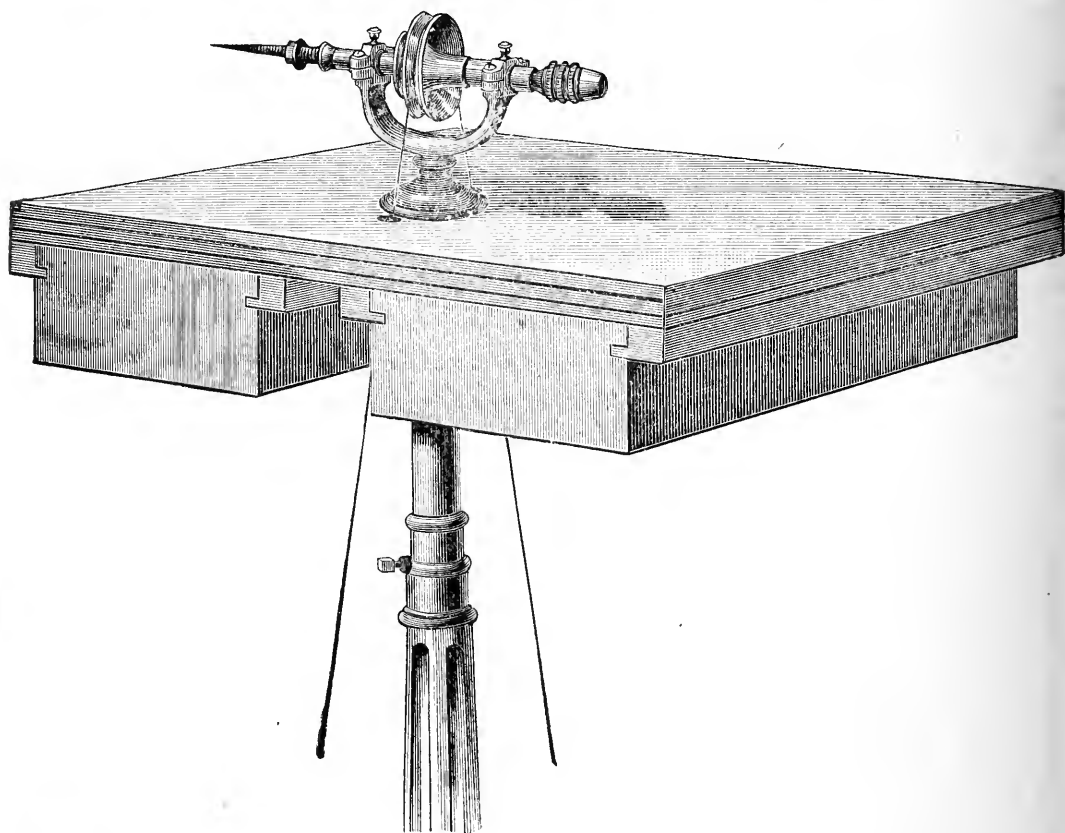
Principal Depot and Manufactory,
620 Race Street,
Philadelphia.

Branch Depot, 514 Wabash
Avenue, Chicago.

JOHNSON & LUND'S

IMPROVED

Dental Lathe, No. 2.



The stand and table of this Lathe are precisely the same as the stand and table of J. & L. Improved Lathe, No. 1. (See page 24.) The Lathe Head is an exceedingly fine article, the workmanship and materials being of the very best quality. The bearings are accurately fitted and so arranged that any lost motion which may occur by wear can be taken up with rapidity and accuracy. It is furnished with a cone-screw on one end and a split chuck upon the other. The chuck is made with a cross-pin at the rear end, which is grasped by the split ends of the mandrels, thus giving them very long bearings. The oil-holes are covered with handsome metal screw-caps. The spindle and pulley-wheels are highly finished, and the framework is Japanned. The Lathe is so constructed that it can be packed in a very small compass.

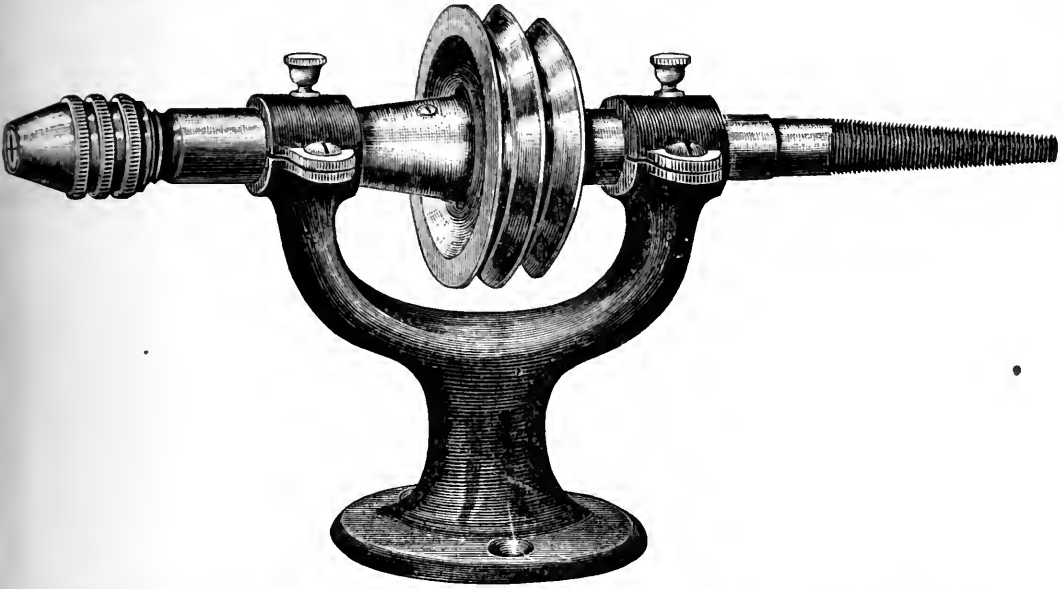
PRICE.

Lathe Complete, with ten Chucks	\$22.00
“ Without Chucks	19.00

For cuts of the ten Chucks and Mandrels, see page 28 of advertisement.

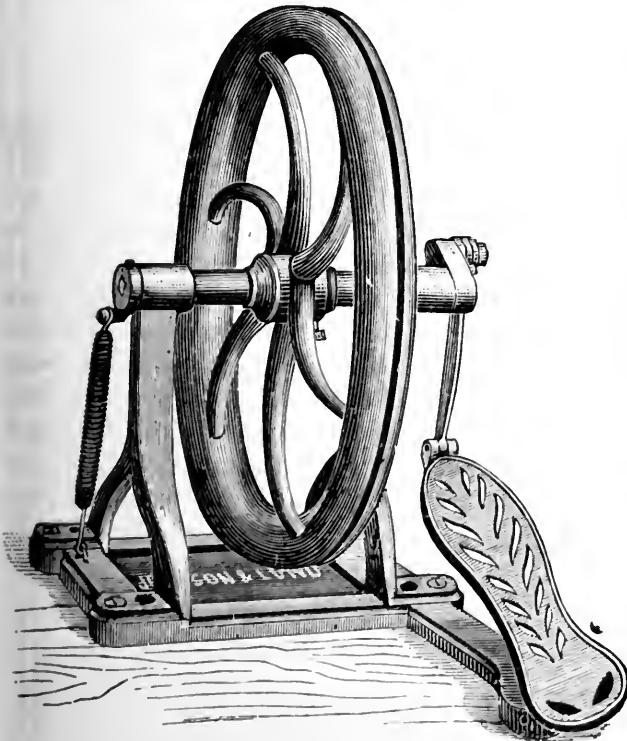
JOHNSON & LUND.

LATHE HEAD, No. 1.



This Lathe Head is furnished with a split-chuck and collar, which allow the mandrels to be changed with great facility, and insures their moving true; the other end of the spindle is made taper to carry brush wheels, felt wheels, &c. Accompanying the Head will be found three mandrels fitted with screws and brass shoulders, one for each size of the threads, fitted in Johnson & Lund's Improved Metallic Centre Corundum Wheels. There are also three brass chucks, which screw on to one of the mandrels, for using corundum wheels made without metal centre. For the cuts of the mandrels and chucks belonging to this Lathe Head see p. 22 of adv. and note at bottom of same page. PRICE COMPLETE, WITH MANDRELS AND CHUCKS, \$6.00. -

The Lawrence Driving-Wheel.

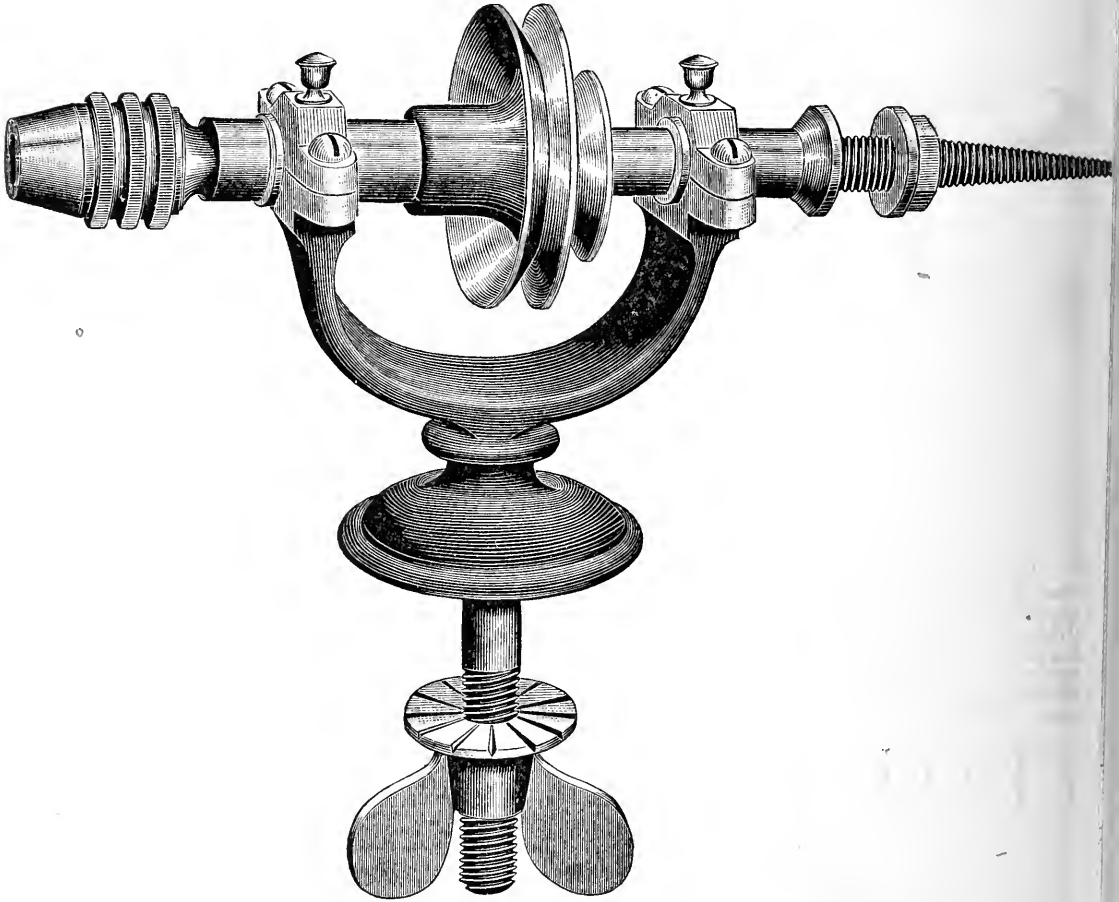


This is by far the most serviceable foot-power ever offered for general use to the profession. The Wheel measures 18½ inches in diameter, and weighs 45 pounds. The entire apparatus is handsomely painted, and each wheel is furnished with a spring for the purpose of keeping the wheel, when at rest, off the centre and ready for action.

The cut is a faithful representation of the article itself.

Driving-Wheel . . .	\$11.00
Cord and Coupling . .	.50

LATHE HEAD, No. 4.

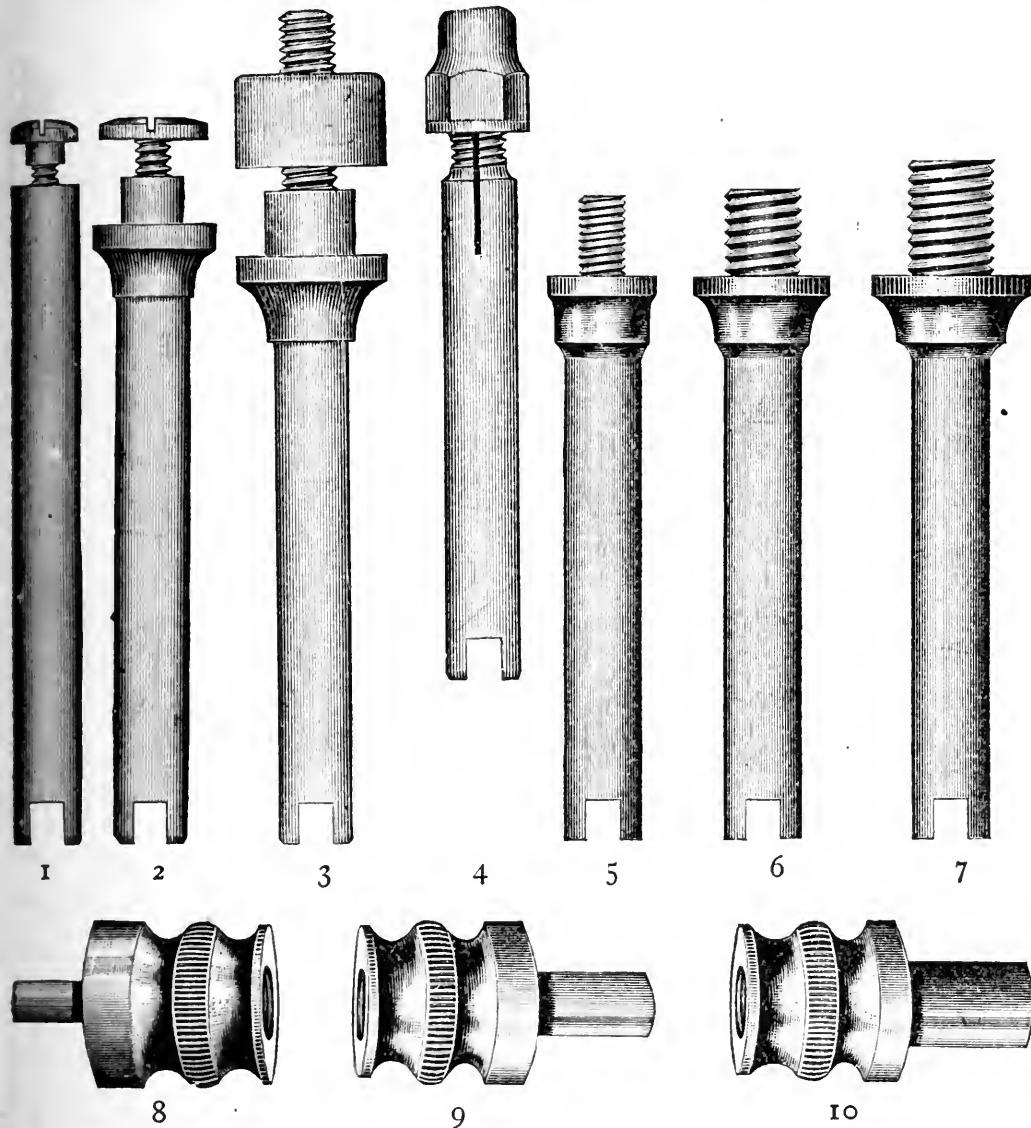


This Lathe Head, in connection with the Lawrence Driving Wheel makes the most complete and satisfactory Dentists' Lathe in the market. It is the best article of the kind ever offered. The workmanship and materials used are of the very best quality. The bearings are accurately fitted, and so arranged that any lost motion which may occur by wear can be taken up with rapidity and accuracy. It is finished with a cone-screw on one end and a split-chuck upon the other. The chuck is made with a cross-pin at the rear end, which is grasped by the split ends of the mandrels, thus giving them very long bearings. The oil-holes are covered with handsome metal screw-caps. The spindle and pulley-wheel are highly finished, and the frame-work Japanned. Ten chucks and mandrels are supplied with the lathe, if desired. For cuts of chucks and mandrels see page of advertisements and note at foot of page 22.

PRICE.

Head complete, with ten chucks	\$11.00
Head, without chucks	8.00

Chucks and Mandrels for Lathe-Head No. 4, and Johnson & Lund's Improved Lathe, No. 2.



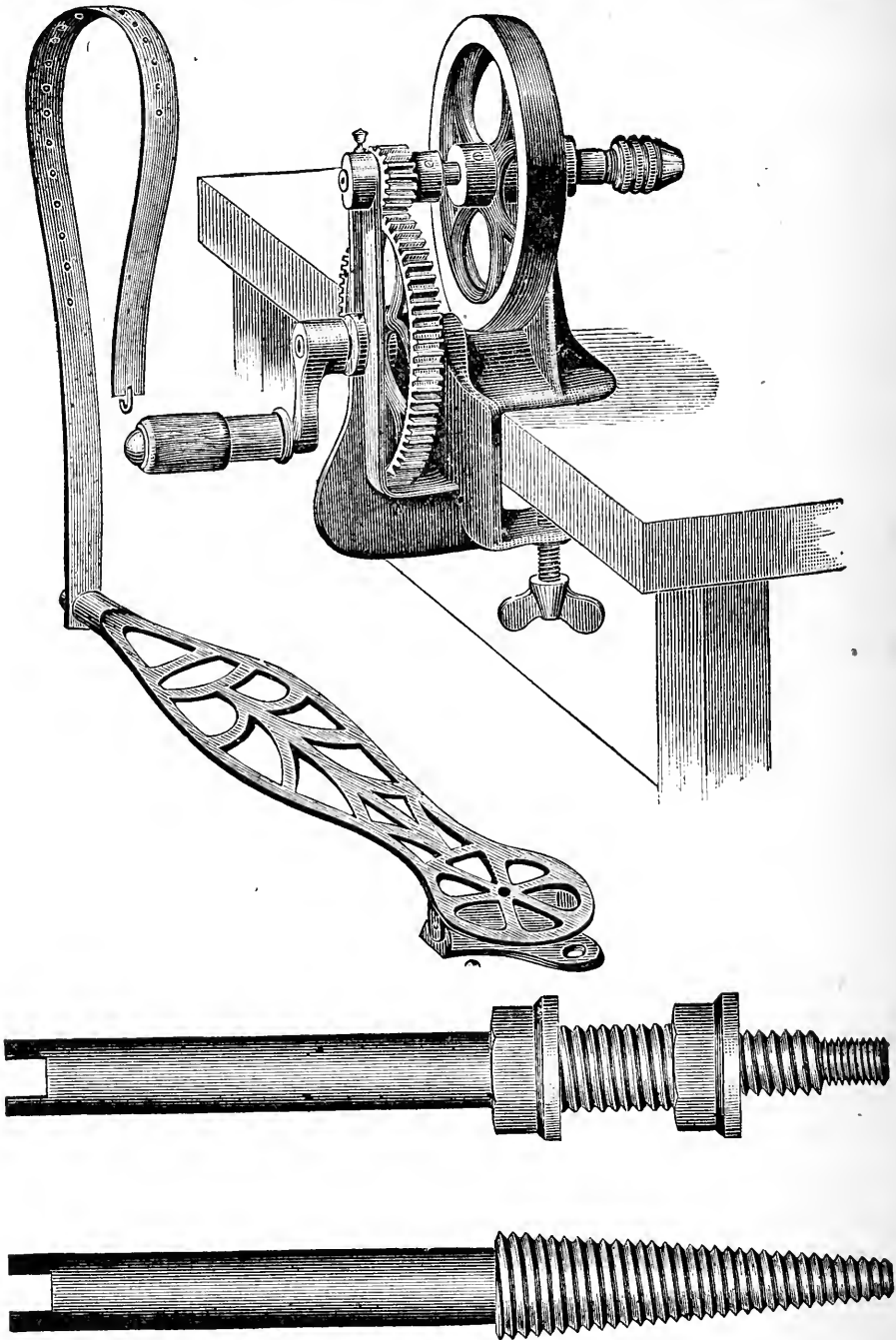
Nos. 1, 2 and 3 are screw chucks for corundum wheels, &c. No. 4 will carry engine burs, drills and tools. Nos. 5, 6 and 7 are screw mandrels for the improved metal-centre corundum wheels. Nos. 8, 9 and 10 are brass chucks fitting upon No. 7, and are intended for shellacing corundum wheels on.

PRICE.

Set of ten Chucks,	.	.	.	.	.	\$3.50
No. 1,	.	\$.30	No. 5,	.	.	35
No. 2,	.	45	No. 6,	.	.	40
No. 3,	.	60	No. 7,	.	.	45
No. 4,	.	1.00	No. 8, 9, 10, each,	.	.	25

NOTE.—A set of Chucks to accompany Improved Lathe No. 1. Lathe Head No. 1 and Socket Lathe Head consists of Nos. 5, 6, 7, 8, 9, 10. Illustrated above.

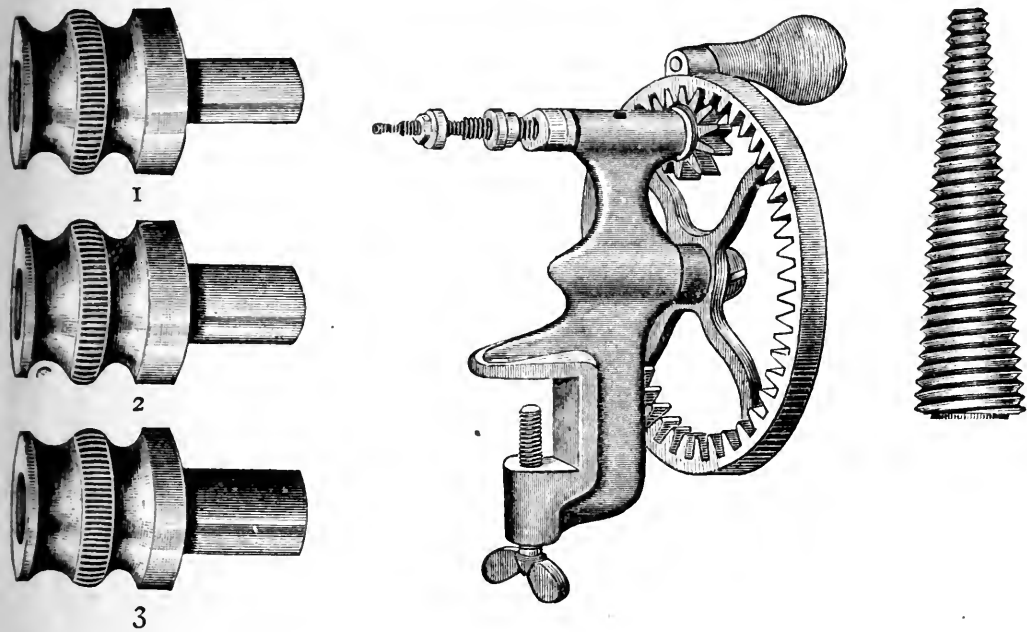
Hand and Foot Lathe



The above cut illustrates our HAND AND FOOT LATHE. It is made with a Split-Chuck similar to the one fitted to our Improved Dental Lathe and various Lathe Heads. It is furnished with a taper Mandrel for the accommodation of Brush Wheels, Felt Wheels, Cones, etc., and with a universal Mandrel which will fit any size of Corundum Wheel, Cone or Cup, made with the Improved Brass Centre, from the very smallest to the largest and thickest sizes. We also send with the Lathe three brass Chucks (illustrated on page 23 of adv.), which screw upon the Universal Mandrel for the convenience of those preferring to use Corundum Wheels without the metallic centre. The Lathe weighs, with two mandrels and three brass Chucks, complete, seven pounds and twelve ounces. The geared wheels are machine-cut, and the workmanship throughout is of the best description.

PRICE, COMPLETE \$6.50

HAND LATHE No. 5.



The above cut represents a portable Hand Lathe for dental purposes. It is well made and weighs only 2 pounds, making it valuable for a traveling outfit. The Lathe is furnished at its shoulder with parting nuts for holding large wheels, and the mandrels are furnished with three different sized threads, which will accommodate any size of the metal centre—can be used with the brass chucks furnished with the Lathe. We also furnish a cone screw for brush felt wheels, etc.

PRICE.

No. 5 Hand Lathe and Chucks	\$3.00
Extra Chucks, each . . . . .	.25

Johnson & Lund,

620 Race Street, Philadelphia.

514 Wabash Avenue, Chicago.

HIGHLY IMPROVED MODELLING COMPOSITION

FOR

Taking Impressions of the Mouth, or any Other Purpose
where a Perfect Impression is Required.



DIRECTIONS.—Softens the Composition in hot water, and when soft enough work in the desired shape with the fingers; place it in the cup, and then soften the surface with dry heat. This makes the surface softer than the main body. It takes a better impression, and hardens quicker. Should dry heat be used exclusively, wet the fingers occasionally to prevent the Composition from sticking. It is not necessary to oil the impression before pouring the plaster cast, as the Composition can be easily removed by immersing for a few minutes in hot water.

No. 0.—EXTRA SOFT.—This grade is for restoring any of the other grades which have become hard by frequent use. They may be mixed in hot water.

No. 1.—SOFT.—This grade is for use in cold water and in tender mouths, and softens at a low heat; hardens in two minutes.

No. 2.—MEDIUM.—This grade is mostly used, and requires a higher heat to soften than No. 1, and sets quicker.

No. 3.—For use in hot weather, and requires a higher heat to soften than No. 2, and hardens quicker.

No. 2 will always be sent unless other numbers are specified.

Price per Pound, - \$1.25. Per Half Pound Box, - \$0.63

Antiseptics and Disinfectants.

SOLUTION CORROSIVE SUBLIMATE IN ALCOHOL (1 part to 10) for facilitating further solution in water (1 to 1000 etc.)	
per ounce, glass stoppered bottles	\$0.35
THYMOL, crystals, a pleasant disinfectant, per ounce, glass stoppered bottle	
	1.00
THYMOL, Solution in Alcohol, a few drops in water is useful to purify the breath, (1 to 10), per ounce, glass stoppered bottle,	
	.35
GLYCEROL OF THYMOL (Thymol in Glycerine), (1 to 100), useful to disinfect the hands, instruments, etc., per ounce, glass stoppered bottles	
	.35
PEROXIDE OF HYDROGEN, for Bleaching and Antiseptic purposes, per ounce, glass stoppered bottles	
	.30
HYDRONAPTHAL, the new disinfectant and antiseptic, safe, non-poisonous and very powerful, per ounce, glass stoppered bottle,	
	.65
LISTERINE, a standard disinfectant, etc., per ounce, glass stoppered bottles	
	.25
IODAL, a new substitute for Iodoform and without its unpleasant odor. An excellent application for purulent or gangrenous condition of the gums, per ounce, glass stoppered bottle . .	
	2.50

JOHNSON & LUND'S

Crimson Brown Rubber.

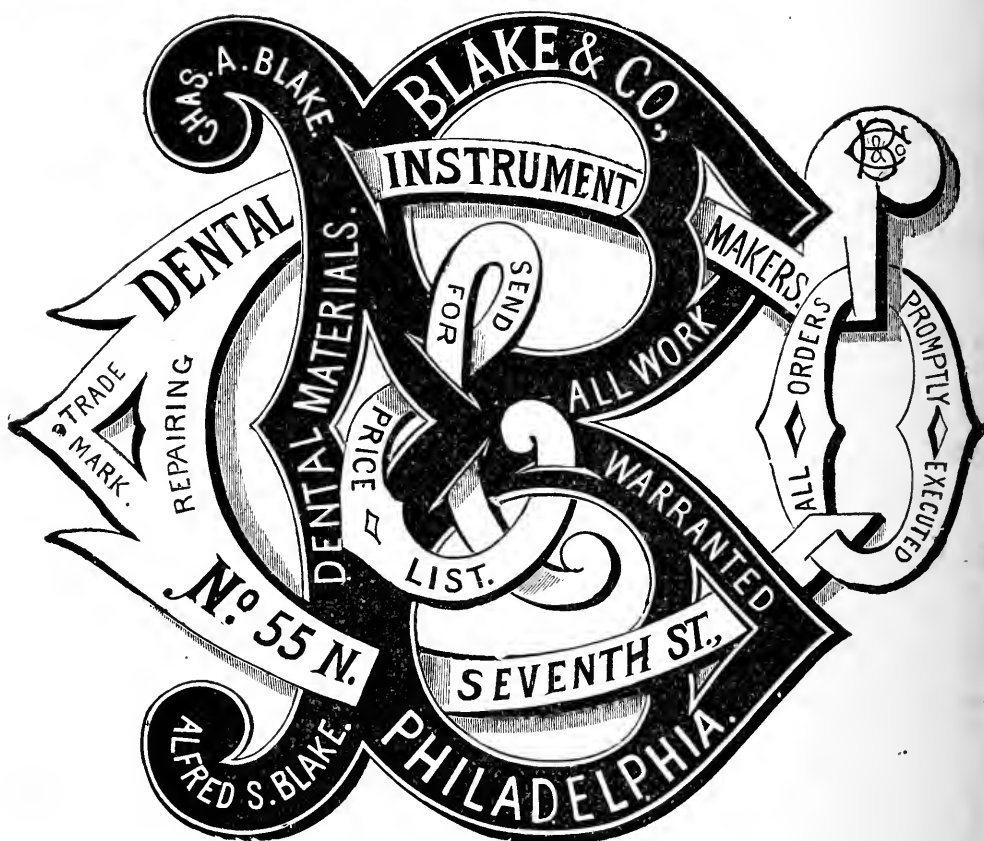
A BEAUTIFUL RICH COLOR OBTAINED WITHOUT THE USE OF MERCURY.

Per pound, - - - - -	\$3.00
" 1/2 pound, - - - - -	1.50

JOHNSON & LUND'S EXTRA PINK DENTAL RUBBER.

Try it! You will like it better than *any other Pink Rubber* in the market. It is much stronger and a better pink.

Price per pound,	-	-	-	-	-	-	-	\$5.50
“ ½ pound,	-	-	-	-	-	-	-	2.25
“ sheet,	-	-	-	-	-	-	-	.35



January, 1889.

MERCURY. Chemically Pure.

Try it. You will use no other.

1 -4 lb Bottle, 40 Cents.

~~Gluten Flour and Special Diabetic Food~~
are invaluable waste repairing Flours, for
Dyspepsia, Diabetes, Debility, and Children's
Food. No Bran, mainly free from Starch.
Six lbs. free to physicians and clergymen
who will pay express charges. For all family
uses nothing equals our "Health Flour."
Try it. Samples free. Send for circulars
to FARWELL & RHINES, Watertown, N. Y.

DR. C H. ECCLESTON'S

NAPKIN AND RUBBER DAM CLAMPS.

Upon the two following pages we take pleasure in illustrating Dr. C. H. Eccleston's Napkin and Rubber Dam Clamps and their uses. These clamps are designed more especially for clamping a folded napkin to the under teeth for temporary or minor operations. They are especially useful for operations upon children's lower teeth. The napkin thus clamped will, for a short time, enable the operator to keep the cavity dry and the tongue away from the tooth which is being operated upon, and avoid the necessity of using the rubber dam. The clamp can also be adjusted to the napkin and tooth without the aid of the clamp forceps, which is a very important feature. Dr. Eccleston has had them in use about three years, and has found them very handy and practical in all operations of the lower teeth, except long and difficult operations.

Below we give a general idea of the applications of the different Nos. of clamps—but the dentist must be governed by the exigencies of the case he has in hand.

No. 1.—For extra large permanent molars.

No. 2.—For small permanent and large temporary molars.

No. 3.—For small temporary molars.

No. 4.—For large cuspids and bicuspid.

No. 5.—For small bicuspid.

No. 6.—For Incisors or very small bicuspid.

Nos. 7, 8 & 9 are intended to take the place of the old style thin band clamp, as they afford more room to the operator, and can be adjusted to the tooth and napkin with or without the ordinary clamp forceps.

PRICES.

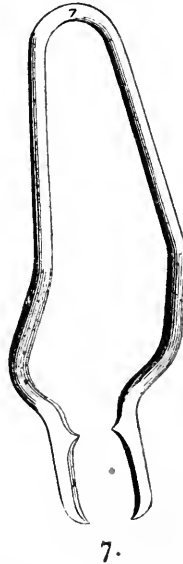
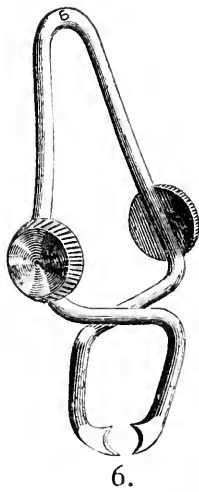
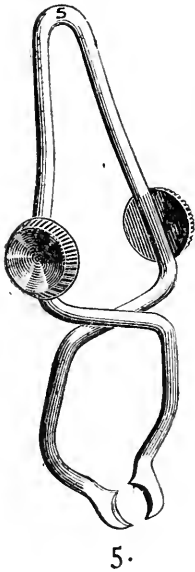
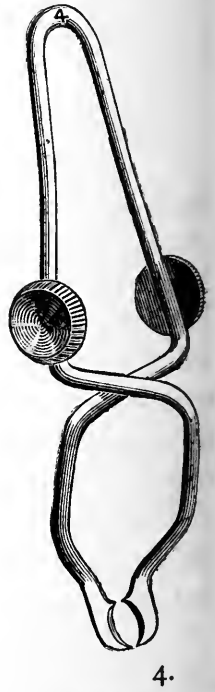
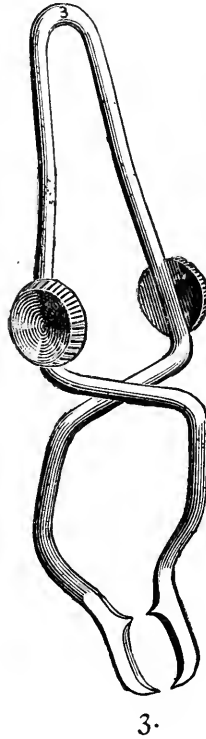
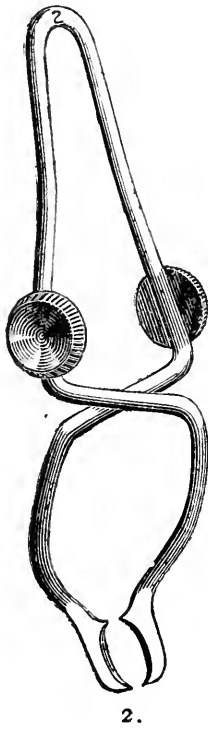
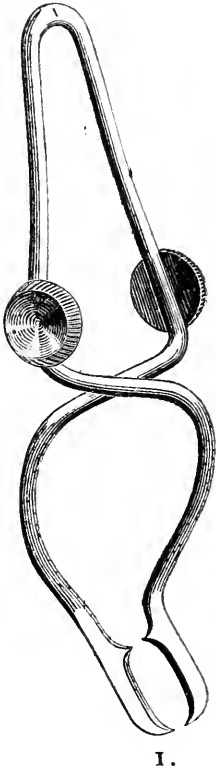
Nos. 1 to 6, inclusive,	- - - - -	each 70c.
Nos. 7, 8, 9,	- - - - -	“ 60c.

JOHNSON & LUND,

514 Wabash Ave., Chicago, 620 Race St., Philadelphia.

THE ECCLESTON NAPKIN CLAMPS.

DESIGNED BY DR. C. H. ECCLESTON.



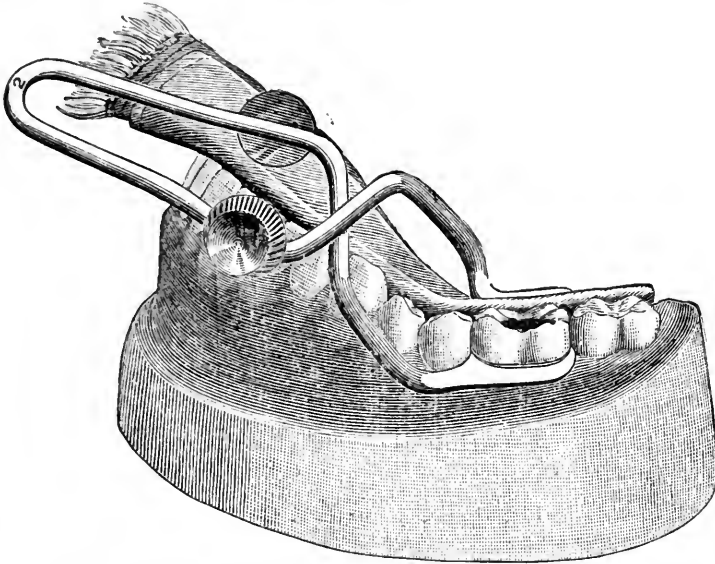
PRICE.

Nos. 1 to 6 inclusive, nickel-plated, each,	- - - - -	\$0.70
Nos. 7, 8 and 9, each	- - - - -	.60

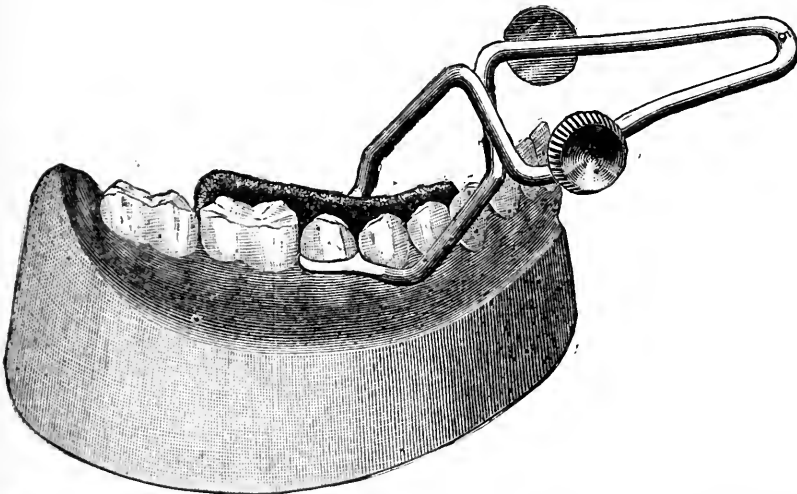
For description see page 27 of advs.

THE ECCLESTON NAPKIN CLAMPS

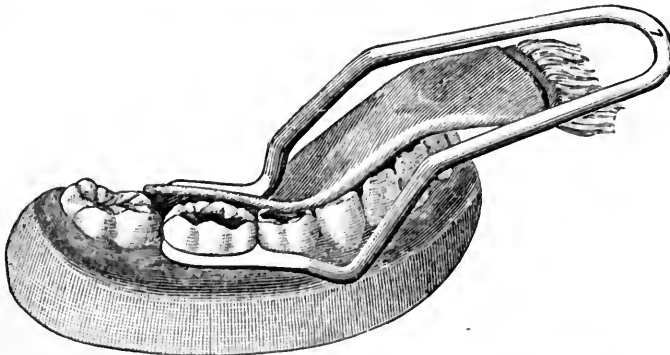
The following cuts show the manner of applying the clamps.



No. 2. clamp, clasping napkin to second molar.



No. 5 clamp clasping spunk or bibulous paper to second bicuspid.



No. 7 clamp, clasping napkin to second molar.

For description see page 27 of advs.

SHOVE AND DRAW CUT EXCAVATORS.

(SET OF 3.)

Designed by Dr. O. P. Lund.

These instruments are useful in reaching places which are with difficulty attained by the ordinary shapes, especially on the cervical margin of a cavity. The cutting edge is at such an angle that they can either be used with the ordinary motion of a hoe excavator or they can be shoved like an engraving tool. This is a decided advantage and with the different shapes of the set give great latitude in their usefulness.

Price per set of 3 engraved handles, nickel-plated,

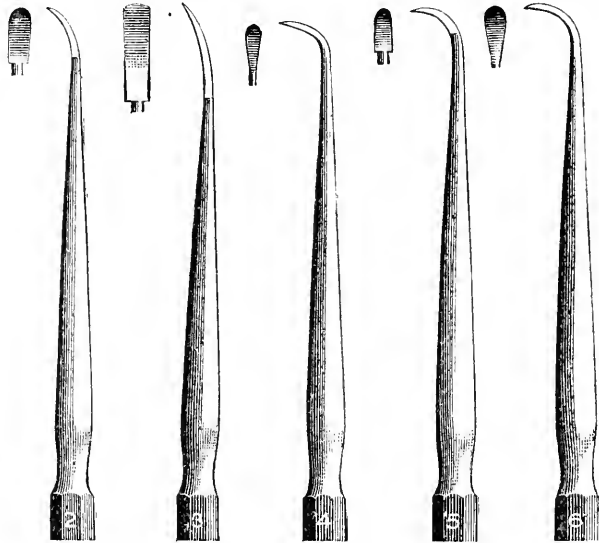
0.75

Each,

0.25

RAPID EXCAVATORS.

Designed by Dr. Charles R. Butler.



These instruments are designed for the excavation of large, open cavities where other means of excavating cannot be conveniently employed, they are made of the best quality of steel and tempered with a particular regard to their use.

Nos. 1, 2 and 3, cut from the operator; Nos. 4, 5 and 6, cut toward him. The forms are such as to readily suggest their application after the cavity is opened up with the enamel chisel.

Price, with plain octagon blued steel handles, per set
of 6, - - - - - \$2.75

Each, - - - - - 0.50

Price, with plain octagon nickel-plated handles, per set
of 6, - - - - - 3.25

JOHNSON & LUND,

514 Wabash Ave., Chicago.

620 Race St. Philadelphia.

DR. CHUPEIN'S COPPER AMALGAM.

Copper amalgam is one of the best preservatives of the teeth except Gutta Percha. Its only drawback being its inability to hold its color in the mouth. As far as has been observed it neither contracts nor expands, but absolutely fills the cavity. It has considerable edge strength. While it turns to almost an inky blackness, it does not discolor the tooth bone. It sets very slowly, especially when used without squeezing the excess of mercury out of it, and it does not, on this account, seem to be applicable for contour work. It is applicable for back teeth in either jaw, and on distal surfaces; and particularly for **desperate cases**. While dryness of the cavity is always recommended, in cases where this condition is impracticable, it may be used with beneficial effect. It is the most economical amalgam, for the pieces left over may be re-heated, ground up and used until all is consumed. If on re-heating the pieces left over, it is found that they are crumbly or work too dry, it will only be necessary to add a very small globule of mercury to restore it to its plastic condition. Although composed only of copper and mercury, it does not seem to leave any metallic or coppery taste in the mouth. It does not appear to be so good a conductor of heat or cold, as either tin, gold, or the ordinary amalgams, and on this account may be used in cavities where the nerve is nearly exposed. Although this is not recommended, it being better in such cases to interpose a non-conducting material under all metallic fillings—still it may be done with success.

Full directions accompany each package.

PRICES.

One-half ounce package,	-	-	-	-	-	-	each, \$.75
One " " "	-	-	-	-	-	-	" 1.50

NEW STYLE BRUSH WHEELS.

Made of Horse Mane Hair. Grade between soft and medium soft. Very dense Splendid polishers.

Letter.	Rows.	Grade.	Diameter.	Bristles.	Face.	Each.	Price.
A	6	Medium soft.	3 in.	Straight	1 $\frac{1}{4}$ in.		\$0.62
B	4	"	3 in.	"	$\frac{7}{8}$ in.	"	0.44
C	3	"	2 $\frac{1}{2}$ in.	"	$\frac{5}{8}$ in.	"	0.35
D	3	"	2 $\frac{1}{2}$ in.	Converging.	$\frac{1}{4}$ in.	"	0.35
E	4	"	3 in.	"	$\frac{1}{4}$ in.	"	0.44
F	3	"	2 in.	Straight.	$\frac{1}{2}$ in.	"	0.25
G	3	"	2 in.	Converging.	$\frac{1}{4}$ in.	"	0.25
H	6	"	3 in.	"	$\frac{5}{8}$ in.	"	0.62

CUP SHAPE.

I	3	"	2 $\frac{1}{2}$ in.	Straight.	$\frac{1}{2}$ in.	"	0.35
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JOHNSON & LUND,

514 Wabash Ave., Chicago.

620 Race Street, Philadelphia.

Plate 1 displays eight figures (2-9) of various fish species, likely from the genus *Scomber*. Each figure shows a detailed drawing of the fish's head and upper body, highlighting the shape of the snout, the position of the eyes, and the structure of the scales. The figures are arranged in two rows of four. Figures 2, 4, 6, and 8 are larger and more robust, while figures 3, 5, 7, and 9 are smaller and more slender. The drawings are labeled with numbers 2 through 9 at the bottom of each figure.

“	“	Engraved steel	“	“	“	3.61
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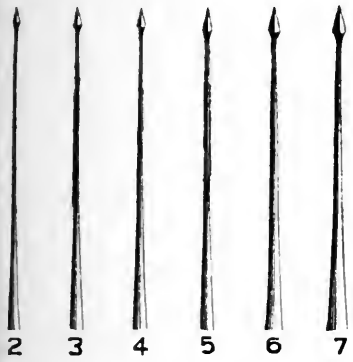
This plate contains 12 detailed line drawings of fossil fish bones, specifically pharyngeal teeth. The drawings are arranged in a single row and are numbered 2 through 12. Each drawing shows the profile of a tooth, which is typically elongated and tapers to a point. Some teeth have a distinct, rounded or flattened base. The drawings are oriented vertically, with the base of the tooth at the top and the tip at the bottom. The numbers 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12 are printed below each corresponding drawing.

" engraved "	" " " "	6.00
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514 Wabash Ave., Chicago. 620 Race St., Philadelphia.

THE HOPKINS NERVE CANAL REAMERS.

Designed by Dr. E. E. Hopkins.



They are very useful for enlarging the nerve canal prior to the permanent filling of the same; and Dr. Hopkins lays stress upon the progressive use of each reamer, beginning with No. 1, and following with the successive numbers until the last number

employed shall so enlarge the cervical opening that free access may be had along the entire course of the canal to its apical termination. The risk of breaking the heads of the reamers is reduced to the minimum, on account of the gradual increase in diameter, which almost entirely does away with the strain of the thin long shanks of the instruments. Angular access through lateral cavities in the crowns is permitted by the peculiar shapes of the sharp cutting heads. For size and shape of handles see Fig. 1.

Price Octagon Steel Handles, Blued, per set of 7, - - - - - \$2.00
Each, - - - - - .30

Nerve Extractors.

Hook and Barb, Square Handles, Blued, Drawn Temper, Made of the Best Quality, will follow the canal nicely.

Price, - - - - - per doz., 2.70
Price, - - - - - each, .25

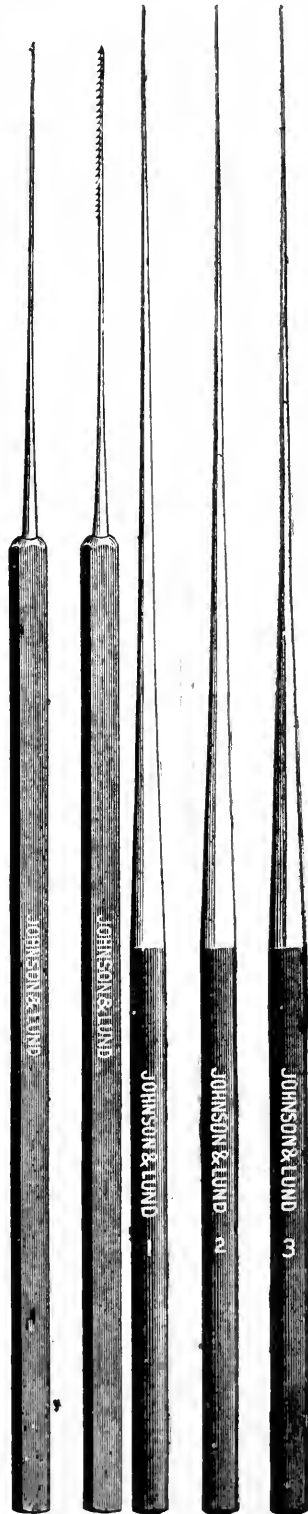
Nerve Probes,

Three sizes, Round Handles, Blued. No. 1. Largest. No. 2. Medium. No. 3. Small.

Price, - - - - - per doz. \$2.00
Price, - - - - - each, .20

JOHNSON & LUND,

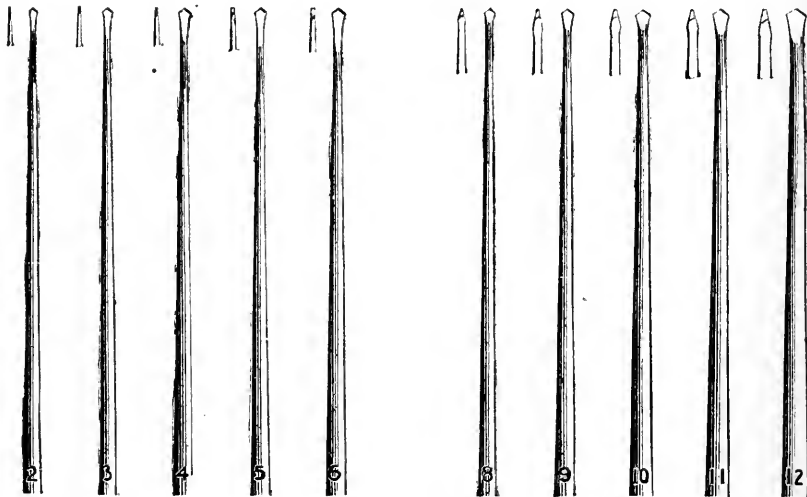
514 Wabash Ave., Chicago. 620 Race St., Philadelphia.



Nerve Extractors. Nerve Probes.

RETAINING PIT AND FISSURE DRILLS.

Designed by Dr. E. Pamley Brown.



Nos. 1 to 6 are for making Retaining-pits.

Nos. 7 to 12 are for opening hard enamel fissures in molars.

Having attained the requisite depth by drilling, it may be found advisable to enlarge the bottom of the pit and to countersink and burnish the margins to prevent the edges crumbling while filling, this is accomplished by imparting to the drill an oscillating motion.

The Retaining-pit drills are $8\frac{1}{4}$ inches and Fissure drills $9\frac{1}{4}$ inches long. The handles are plain octagon steel, blued.

Price, - - - - - per set of 12, \$5.75.

Price, - - - - - each, .50.

JOHNSON & LUND,

514 Wabash Ave., Chicago.

620 Race St., Philadelphia.

FOR SALE,

A seventeen-years' practice in New York State. Manufacturing town and several tributary towns; fine farming country. Competition light; no graduate in the vicinity. *Time given* to pay out of the practice.

Address EMPIRE STATE,
Care JOHNSON & LUND,
Philadelphia, Pa.

Britannia Impression Trays.

ADVANCE IN PRICES.

Tin, which enters into the composition of Britannia, of which our Impression Trays are made to a much greater extent than any other metal, having advanced in price very nearly 100 per cent., we are compelled to make the following changes in prices of Impression Trays.

Uppers, Round Bottom,	Nos. 1 to 8,	each,	\$0.30
" Flat	" 12 to 16,	"	0.30
" Round	" 2½ to 3½,	"	0.30
Lowers, " "	" 1 to 7,	"	0.30
" Partial	" 8 to 9,	"	0.30
" " Open Cavity,	" 10 to 13,	"	0.30
" " Closed,	" 10 to 13,	"	0.30
" Flat Bottom,	" 14 to 16,	"	0.30
" Round Bottom,	" 18 to 19,	"	0.30
M. L. Lmgs, Lower,	" 20,	"	0.35
Partial Upper Trays for Crown Work, No. 9,	"	"	0.25
" " " " " " 10,	"	"	0.30

Johnson & Lund,

514 Wabash Avenue, Chicago.

620 Race Street, Philadelphia.

Mounted Corundum Disks !

Mounted Corundum Disks for Engine, each,	25 Cts.
Mounted Corundum Stump Wheels for Engine, each,	20 "

JOHNSON & LUND,

514 Wabash Avenue, Chicago.

620 Race Street, Philadelphia,

Metatlic Air Chamber Patterns !

Price, per dozen, thin,	20 Cts.
" " " thick,	25 "

JOHNSON & LUND,

514 Wabash Avenue, Chicago.

620 Race Street, Philadelphia.

Brush for Cleaning Artificial Sets,

SUGGESTED BY DR. G. J. R. MILLER.

This brush fills a void that has long existed. The brush is made of the best Russian bristles, wire fastened. The back is left open to afford a free drainage to the water, and to prevent the bristle falling out, or becoming musty. We are satisfied that a simple recommendation of the brush by the dentist to the patient will insure a ready sale.

Price per dozen, \$3.00

“ “ brush, 0.30

JOHNSON & LUND,

620 RACE ST., PHILA.

514 WABASH AVE., CHICAGO.

Melting Ladles

WITH DETACHED HANDLES.

No. 1.—5 inches in diameter, and 3 inches deep, . . . each, \$0.40

“ 2.—4¾ “ “ 3 “ “ . . . “ 0.25

“ 3.—4½ “ “ 2½ “ “ . . . “ 0.25

Handles of wrought iron, with wooden grips, . . . “ 0.25

JOHNSON & LUND,

620 RACE ST., PHILA.

514 WABASH AVE., CHICAGO.

Spatulas for Mixing Plaster.

Steel Spatulas, riveted handles, 4 inches, . . . each, \$0.25

“ “ “ “ 5 “ . . . “ 0.30

“ “ “ “ 6 “ . . . “ 0.40

“ “ “ “ 7 “ . . . “ 0.50

JOHNSON & LUND,

620 RACE ST., PHILA.

514 WABASH AVE., CHICAGO.

THE Dental Office and Laboratory.

FOURTH SERIES.

VOL. 2.

PHILADELPHIA, JULY, 1888.

No. 3.

THE DENTAL LABORATORY.

BY THEODORE F. CHUPEIN, D. D. S. PHILADELPHIA, PA.

Continued from Page 31, April, 1888, Number.

For making dies and counter-dies *Zinc* and *Lead* are mostly employed. There are other compounds used, but these are the metals that yield the best results. For melting these metals cast or wrought *iron ladles* are required. These are made with fixed and detachable handles. Either have their advantages, but the ladles with detachable handles have the advantage of occupying less room. Such a ladle can be placed in the furnace and lifted out by inserting the handles in the slot when the metals are fused. *Two of these ladles* will be necessary, one for zinc, and one for lead, and great care should be observed in not permitting the metals to be mixed, as also in not allowing them to be over heated, which spoils the zinc, particularly. A simple blast furnace may be employed for melting these metals, but in lieu thereof, an ordinary cylinder stove, such as is used for heating purposes, answers well. When a good pressure of illuminating gas may be obtained, there are some large Bunsen burners made according to patterns of Mr. Fletcher, of England, and made in this country by the Buffalo Dental Manufacturing Co., which with a sheet

iron jacket and cover may be used also for melting zinc. A still better appliance (but more dangerous) for this purpose is the gasoline furnace. It is extensively used by plumbers for melting lead or solder. It does the work of melting zinc very promptly and the cost is nominal. But the exceedingly inflammable nature of gasoline, which is used in it, makes it undesirable, unless the melting process be carried on in the open air, as well as the gasoline (kept for replenishing the furnace), be also kept outside of the household. Fig. 6 represents this furnace.

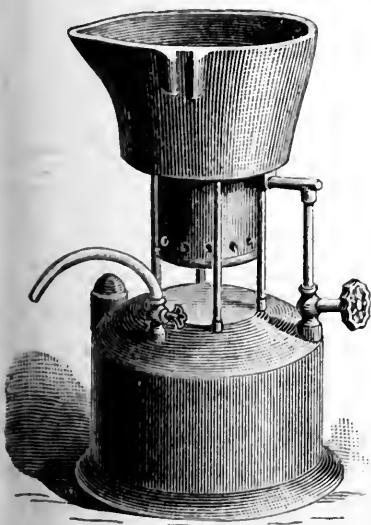


FIG. 6.

Casting rings should be had for obtaining impressions in the moulding sand, from the plaster model. These may be made of wood but are preferable to iron, or still better of copper which are more cleanly not being affected to rust by the moisture of the moulding sand. To make these dies and counter-dies, a separate table or bench is used, and no better arrangement for this work can be constructed than the one suggested by Dr. W. H. Trueman and illustrated in the recently published work, "American System of Dentistry" from which I make a copy.

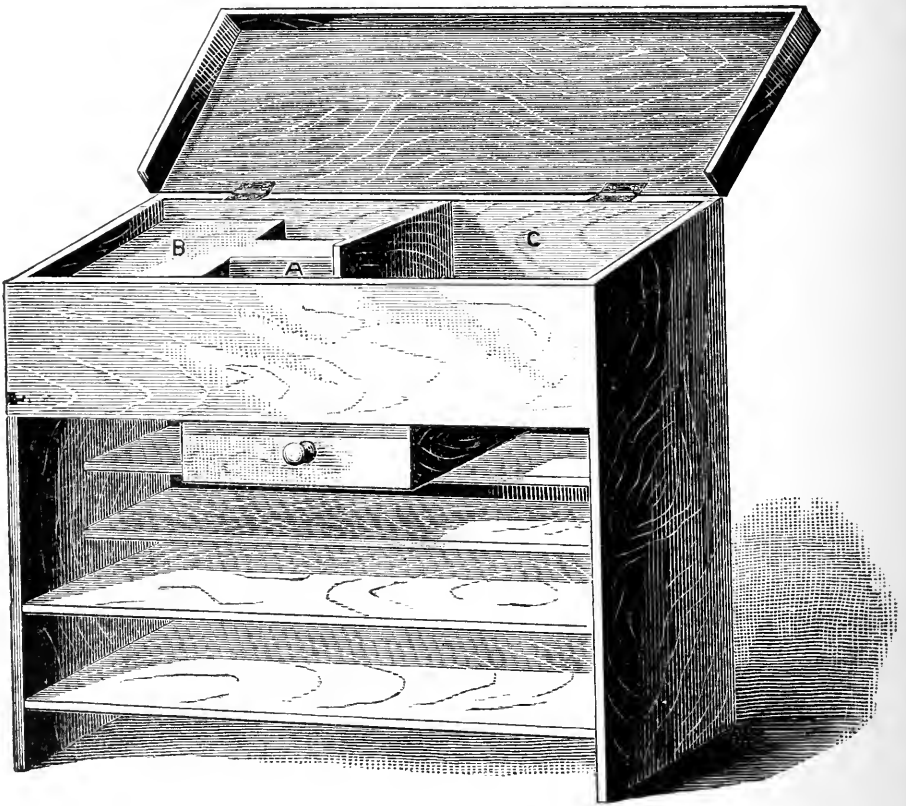


FIG. 7.

Dr. Trueman gives the following description of it: "The box is divided into two compartments, and it is lined with sheet copper. The compartment on the right hand (C,) is for damp moulding sand ready for use. The left hand compartment contains a fixed block (A) placed in the front right hand corner; the face of this block is about six inches square and about an inch below the edge of the box. On this the moulding is done. The remaining portion of this compartment is covered with a movable cast-iron tray (B) on which the moulds are set when ready to pour. After the sand has been used it is passed into the box beneath through a square hole at the right hand corner of the tray. By this arrangement the wet and dry sand are kept separate, and the tray is not kept encumbered with the sand that has been

used. The tray being made of cast iron, is not injured by the heat, and any metal spilled upon it is readily recovered. It is very desirable in moulding that the moulds already made shall not be injured or shaken by the manipulation necessary in making others. It often happens that the sand is broken away, yet is not so much displaced that it may be accurately readjusted and a good cast obtained from it. In these cases a very little shaking would ruin the mould. In the bench referred to this is provided for by doing all the moulding on a solid block that is not directly connected with the tray on which the flasks are placed for pouring. Underneath the box is a drawer in which the tools used in moulding are kept, and underneath this, forming a stand for the box, are some four strong shelves, covered with sheet zinc to prevent wear, on which the flasks, new and old dies, zinc, lead, etc., are kept."

The tools used for moulding are *a sieve* made of fine brass wire; *a small brush* like a paint brush to brush the sand off the dies; *a spatula* to smooth the sand from the top of the casting rings; *a glass tube* or old blow pipe to blow out small particles of dry sand that may have fallen into the mould; *an iron spoon* to clear away the dross which collects on the top of the ladle of melted metal and prevent it from being poured into the mould; *a small hammer and a small cold chisel* will be all the tools necessary for this part of the work.

MOULDING.

The model prepared by being beveled and varnished and dried, is laid on the moulding block. A casting ring of proper size is selected and this is put over the model. The sand which has been moistened, but not made too wet (only moist enough that when a handful is taken and pressed it forms an adherent lump), is put into the sieve and sifted over the model encircled by the casting ring. After the model is covered with the sifted, moistened sand, the balance of the casting ring may be filled by simply putting the sand in with the hand, being careful that there are no large or dry lumps. The casting ring being thus filled without using any more pressure to pack the moulding sand that can be used with the fingers—for the sand should not be packed tight or hard—the sand is made smooth with the spatula. The casting ring is now reversed, which brings the base of the model into sight. Should the sand around the edges of the model be found very loose it may be pressed by the fingers against the casting ring and against the model. The spatula is now used to remove any over-hanging sand, by cutting this away carefully all around the edges of the base of the model. This being done the casting ring is taken in the left hand and reversed, holding the model so it will drop into the sand box. Should it not do so, a few light taps with the handle of the

spatula or a light wooden mallet in the right hand, will dislodge it. Sometimes in pouring the zinc into the moulds it will be found to bubble. This is caused either by the sand being too wet, or by its being packed too tight. This may sometimes be avoided by taking a knitting needle and passing this through the sand, at some unimportant point towards the heel of the mould, and then elevating the casting ring by placing two old excavators beneath it, so as to allow a vent for the steam to pass out, when the metal is poured.* Before pouring the zinc, the dross which collects on the top of the ladle should be removed or held back with an iron spoon, so it will not pass into the mould.

It is desirable in very deep mouths or high arches to make heavy dies, that will stand heavy hammering. This may be done by having a casting ring of the same size as the one used to make the mould, and when the mould is poured full, and when the metal is observed to begin to chill, to lay this edge to edge on the other casting ring and pour the remainder of the zinc into it. In this way quite a strong heavy die may be made. If the case be hurried the dies may be chilled, so as to make the counter-dies at once; but it is preferable to let the metal cool down gradually.

The die being made, the face of it is painted all over with thin whiting and water and left to dry. The die thus prepared is now laid on the table, face uppermost. Moulding sand is now banked up all around it so as to form a kind of terrace, leaving only so much of the face of the die (or a little more all around) exposed, as will be covered by the plate. A casting ring is placed over the face of the die resting on the sand terrace that has been banked up. More sand is now carefully put around the edges of the casting ring to prevent the escape of the melted lead when it is poured on. The lead should not be too hot, otherwise it may adhere to the die. The object of painting the face of the die with whiting is to prevent this, yet despite of this precaution, the metals will adhere if the lead is poured on too hot.

There is a simpler way of preparing the die so that the counter-die is made with less trouble, but we do not think that a plate can be so well swedged, as by the plan above described. It might be well to prepare the best die in the manner described for the final swedging, and the others in the manner which will be set forth. After the mould has been made as already described, take the casting ring in the left hand and invert it. With the spatula in the right hand dress away carefully all the sand in the ring to about a half or three-quarters of an inch from the edge of the casting ring, leaving this bare. When

* See the remarks of Dr. H. P. Osborn, under the heading of "Correspondence" in this number, on this subject.

the zinc is poured, it will fill all over the face of the mould, and up to the ring where the sand has been dressed away. When the counter-die is to be made, it will only be necessary to place the die within the ring and pour the lead on. The objection to this form is that in swedging as much pressure is made against the square shoulders of the die and counter-die as on the plate being swedged, whereas in the other plan all the pressure is brought against the plate. Should there be any zinc or lead left in the ladles, after making the dies and counter-dies, the dross should be removed with the iron spoon, and what remains be permitted to cool *in the ladles* instead of pouring it out into any receptacle, for on remelting, for other cases, the whole force of the heat will be exerted on the ladle and its contents instead of only on isolated old dies that may be put in for remelting.

The dies and counter-dies having been made as described, they are separated from each other, brushed and cleaned ready for use. All the tools are now wiped and put away, and the moulding bench cleaned and closed until again needed.

In making dies for partial cases, the remaining teeth sometimes stand in such relation to each other, that it is impossible to withdraw it from the moulding sand perfect. When such cases are intended to be supported by clasps, the clasps are first bent, to fit the teeth to be clasped; after this, it has been our custom to break off the plaster teeth from the model, as close to the gum surface as possible. These teeth, with the pins that run through them, are laid aside carefully, and the die made as described. When the dies are made, the teeth may be replaced to the model, in exact apposition, by the help of the pins, and the two stuck together as firmly as if never broken, by means of a little *Phosphate of Zinc* mixed quite thin.

SWEDGING.

The next operation is the swedging of the plate. For this purpose a pattern of the plate is made of what is known as pattern-metal. This is nothing more than a foil made of tin and lead, the two outer surfaces being tin, the inner lead. It is rolled quite thin, and is so malleable that it may be readily pressed with the fingers all over the surface of the die. This being done, it is cut into the shape of the future plate (slightly larger, to allow for variation in swedging) with the end of the sharp blade of a pen-knife. This done, it is carefully flattened and laid on a piece of gold or silver plate and its form traced thereon with any sharp point. The plate is then annealed. To accomplish this, it is laid on a piece of charcoal and the blaze of a spirit-lamp (or gas blow-pipe, which is preferable) is blown on it with the mouth blow-pipe until it is red-hot. It may be plunged in water to cool, which does not seem to harden it. We have been told by an

operator, who does considerable plate work, that if the gold plate when it is annealed is thrown or plunged into alcohol, it will be made much softer, and consequently more easily swedged.

A very handy adjunct of the laboratory is a piece of *charcoal for annealing*. This may be made neater by sawing a piece square from any good close-grained block of *pine charcoal*. We say pine charcoal, as oak charcoal will not do. In the latter particles fly off into sparks when the flame is thrown on it, making it useless and very disagreeable for the purpose. The block should be cut about two and a half inches square by one inch thick. To have this handy without soiling the fingers a very nice receptacle may be made for it of a piece of sheet-iron, cut out like Figure 8.

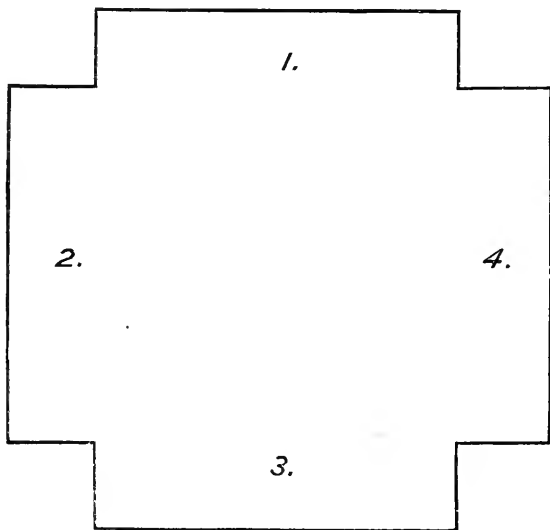


FIGURE 8.

After this is cut out in this way a small hole is punched through it at the centre. An old excavator may be filed at the butt end of the handle to a shoulder, until it passes through the hole. The piece of sheet-iron is now bent up at its sides (1, 2, 3 and 4) with a pair of large flat-nosed plyers until it forms a box. The filed end of the excavator may now be riveted to this iron box, and the tapering end of the excavator driven into a suitable handle. The piece of charcoal can be set into this box, which makes a nice tidy appliance on which not only to anneal plate or wire, but also to solder small pieces.

The plate being annealed and cooled, it is held between the fingers and thumb of the left hand while with a *horn hammer* in the right it is hammered in an approximation of a shape, frequently annealing it to prevent its cracking. This operation is assisted by means of the *plate benders*, as also the *round and flat-nosed plyers*, being careful when using these not to mar or bruise the plate. In hammering up

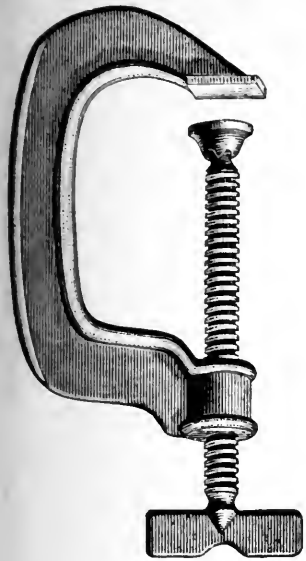


FIG. 9.

an upper plate, particularly a full upper, there is a clamp made which is quite serviceable. After the plate has been stretched with the horn hammer down to the die, on the palate surface, it is cut at the median line with the *plate shears*. The clamp is now applied by clamping the plate as well as the die to the work-bench, putting a piece of soft paper or rag under the screw, so that this may not bruise the plate. All being firmly clamped down, the plate may be stretched over the front of the ridge by means of the horn hammer, while the plate and die are thus clamped. Figure 9 illustrates the clamp.

The plate being thus bent and hammered into shape, it is annealed before placing the counter-die on the die. When this is done it should be gradually *coaxed up*, removing the counter-die from time to time to ascertain if the plate is being carried to its proper place; this being made certain by frequent examinations or corrections, the die may be driven home to its place. After each annealing of the plate, it is well to throw it into the pickle to clean it off.

It is well to make three dies and three counter-dies for each case, reserving the *best* of the three for the final swedging. To hammer up the plate into the approximation of shape, as above described, the *worst* of the dies may be used first, as the better dies, used for the final swedging, will correct any inaccuracies existing in the first dies used. The plate being thus roughly swedged is now cut into *nearly* its proper dimensions with *files*, *shears*, and in partial cases, where teeth remain, the *plate-cutting nippers* are handy for cutting out those semi-lunar places around the teeth. When this is done, the plate should be examined to ascertain if no lead or zinc has adhered to it before it is subjected to another annealing. If any is discovered it should be removed by means of a pointed soft pine stick, charged with fine pumice and water. Thus cleaned it may be annealed. A good plan to prevent the zinc or lead from adhering to the plate is to oil the die and counter-die with a thin film of oil before swedging.

The plate is now laid on the second die and the counter-die placed on it, and driven home as before. In swedging, a heavy hammer, weighing about six or seven pounds, should be used, and the *die* (not the counter-die) struck with this. The hammer should be held in the right hand by the handle, about three or four inches from the hammer head. The die should be held with the left hand on an anvil, which should be placed on a block for the purpose.

To be continued.

THE PRACTICAL PLACE.

PROHIBITION.

Waiter: "Any fling mo', sah?"

Guest: "Yes; bring me a—(winks)—you know (winks) "

Waiter: "Can't do it, sah; dis am a probishun town, sah, an' you is a stranger."

Guest: "What of that?"

Waiter: "De boss says winks don't count fur nuffin unless we's 'quainted wid 'em."

Elderly Young Lady—(to dry-goods clerk.) "This material is very nice, but the color is too striking. It would be more appropriate for a younger person."

Dry-goods Clerk—"Oh, by no means, madam; you are not so old—as you look to be!"

THE HORSE BLEW FIRST.—A veterinary student, having been sent to administer a dose to a sick horse, was asked by his preceptor what success he met with. "None at all," he replied: "the horse bit me." The preceptor then explained that he should have put the powder into a medicine tube, and placing one end in the side of the horse's mouth, blow it into his throat; whereupon the student proceeded to act upon the suggestion. Returning again, he was asked what success he had this time. "None at all," he replied: "the horse blew first!"—*Popular Science News*.

TO MAKE SHEET WAX.—Make a mould by pouring plaster in a large platter; when hard, remove it. This will give a large, smooth surface. Wet the mould, so the wax will not stick; rest one edge on the edge of the vessel containing the melted wax, raise the opposite edge, so it will incline a little, and pour the melted wax on it with a large spoon. Any excess will flow back into the vessel. Dip the mould in water; the sheet of wax will float off. If the wax is too hot there will be bubbles in the sheets.—*J. J. Reed, in Western Dental Journal*.

DENTAL ECCENTRICITIES.—Pliny the younger relates that Marcus Curius, nicknamed *Dentatus*, had all his teeth at birth. Richard III did the same, and Jacobi reported the case of a Spanish dwarf, who was born with all his teeth, all of which remained; he had a beard at seven years of age, and became a father at ten. A woman named Mary Wood, æt. 98, had nine new molars at that age, and a certain Scotch farmer lost all his teeth at sixty years of age, and six months later he cut a new set without the aid of a dentist, and had them all when he died at ninety-six years of age.—*Medical Press*.

THE *Chemist and Druggist* gives the following receipt for writing on steel: dissolve powdered sulphate of copper in a small quantity of water; rub the surface of the steel over with a piece of wetted soap, so as to cover it with a thin coating; then dip the point of a pencil into the solution, and with it write or draw the required design on the steel. Let this remain for a short time and then wash off, and the steel will be found to be beautifully and permanently engraved. Every physician is very careful to protect his books, why not write his name upon his instruments also? Then if an office is robbed it will be an easy matter to claim instruments that have been taken.

TOOTH POWDER. BY J. W. ADAMS, BRISTOL, PA.—From receipts given I am led to believe pumice is often an ingredient of tooth powder! Is this not a step backward? Was it not well settled, some twenty years ago, that all of the ingredients of a tooth powder should be soluble in the fluids of the mouth? Time was when the common tooth powder was vile trash! Made by compounding pumice, orris root, rose pink, charcoal, gum myrrh, etc., in different proportions. But a better day came and all these but orris root were abandoned. Prof. G. T. Barker introduced a powder composed of chalk, cuttle-fish, orris, sugar and carmine. This was a great improvement; each article being soluble except the cuttle-fish bone. In time that was left out, then we had a soluble compound. The high pressure of "Young America" may desire a more active, gritty powder; something that will do its work quicker. But the immediate speed secured is at the expense of insoluble grit around the necks of the teeth, under the free edge of the gums. As made at the present time, and for years, the formula of "Adams' Tooth Powder" stands:

Best English precip. chalk.....	4 pounds
Pulv. orris root.....	1 pound
Carmine No. 40.....	1 ounce
Pulv. sugar.....	3 pounds
Oil of rose.....	1 drachm

Grind the carmine before mixing. Put the first three ingredients together grind well and pass through sieve No. 60. Then add the sugar and incorporate it with the other ingredients. Lastly, add the oil of rose, and mix the mass again thoroughly. The addition of a little aqua ammonia before the last mixing will assist in bringing out the color. When finished the powder must be kept under seal.

This powder is nearly always beneficial and never hurtful. It does not create as much friction as powders having grit; but it does the patient no harm if it does him no good. Ground pumice as a scouring article is used on the teeth with a stick by hand, or by a wood point in the engine; but when the operation is completed the grit

should be thoroughly washed away. This scouring and washing should be followed by a good rubbing with tooth powder on muslin. Some use the ordinary napkin wrapped around the index finger, wetted and dipped in the powder; but it is more economical to have several fine muslin pieces ready, six or eight inches square. These muslin squares are also good with the pumice powder for scouring.

Charcoal, though a good disinfectant, is an abomination in the mouth. It is insoluble, however fine you may grind it, and like all other insoluble grit, you cannot wash it entirely from the necks of the teeth.—*Items of Interest.*

USES OF CALENDULA.—DR. H. B. CATCHING says regarding tincture of calendula: To the dentist, it is of the greatest value. Applied to wounds, incised or lacerated, it is healing. A half drachm in a glass of water is soothing to the gums during the removal of calculous. As a mouth wash after the extraction of teeth one ounce to seven ounces of water, with forty drops of carbolic acid, is not only beneficial, but pleasing to the patient. In Rigg's disease, after the scraping or scaling has been thoroughly done, the same wash, used in connection with chloride of zinc (thirty grains to the ounce of water) applied with a sable brush to the pockets is of value. To irritated pulps it is soothing. In treating the severed end of blood vessels after the removal of pulps, its properties are valuable. For offensive breath, a few drops in a glass of water is effectual.—*Southern Dental Journal.*

SWAGING MACHINE.—MR. L. MATHESON after experimenting with the Tauber Hydraulic Press says: The object of the invention is to supercede the ordinary zinc and lead casts and dies in the making of metal dentures, by the employment of hydraulic pressure, applied directly to the plate, resting upon a cast of Spense metal—a curious compound which it is possible to pour, whilst molten, into a Stent or gutta-percha impression, but which, when cool, is quite hard enough to bear a strain greater than zinc. Two claims are made for the machine. (1) That a great saving of time is effected by doing away with the necessity for the ordinary casts and dies; and (2) that a good fit is obtained with more ease and certainty than by the method now in use, owing to the principle of the appliance, by which pressure is brought to bear equally on all parts.—*British Journal of Dental Science.*

• IODOFORM VAPOR.—DR. W. H. WHISTLAR says: In pulpless and foul-smelling teeth, or for the purpose of antiseptics in the case of exposed or nearly exposed pulps, and where it is desirable to have dryness, and medication by liquids may not be easy, I take an ordinary chip-

blower syringe and dip the nozzle into a quantity of iodoform, at the same time compressing and relaxing the bulb which draws the iodoform into it. Heat the nozzle quite hot over a flame and direct the vapor as desired, compressing the bulb to expel the iodoform, which is carried with certainty to every portion of the cavity to which the vapor is directed. This iodoform vapor will also have its effect on the pulp by being absorbed and assisting to tone up the lagging member. A fresh tonka bean will completely disguise the odor of one ounce of iodoform, with no detrimental effects and render it sweet-smelling.—*Dental Review*.

DESTROYING PULPS.—DR. C. J. TIBBETS recommends *arsenite of potassa* for destroying the vitality of tooth-pulp. The preparation is made as follows: take twelve grains of caustic potash, ten grains of arsenious acid, place in a mortar and add a few drops of water to assist in reducing the potash and arsenic to a thick, creamy paste, then add ten grains of sulphate of morphia (or muriate cocaine) and stir for fifteen or twenty minutes to prevent re-crystallization; keep in wide-mouthed bottles, well stopped with cork boiled in paraffine." In applying the paste the same precautions are to be used as with arsenic. The cavity is sealed with gutta-percha, incorporated with enough wax to render it non-plastic. The arsenite of potassa may be applied to the pulp of an aching tooth, it matters not how great the congestion may be, and in from three to twelve hours the pulp may be entirely removed. If the dressing be undisturbed for ten or twelve days, most frequently no remains of the pulp will be found save a soapy condition of the chamber and root canals, rendering the subsequent cleansing a very easy matter. No greater pain will follow the application than that which caused the visit.—*Chicurgical Denial Journal*.

SAVED BY PLASTER PARIS.—*How a man escaped bleeding to death, Dr. Kingsbury's Timely Suggestion.*—The life of Gottfried Frick, the Williamsport baker who for several days lay bleeding to death in that city, the result of the extraction of a tooth, has been saved by Dr. C. A. Kingsbury, of this city, who telegraphed the directions necessary to stop the hemorrhage.

On Monday a special dispatch to the *Press* told how the extraction of one of Frick's teeth by Dr. Rhodes, a leading physician, had been followed by a flow of blood which four physicians could not check. When Dr. Kingsbury read this he was reminded of a similar case in this city twenty years ago, which he had brought to a successful conclusion by the application of plaster of Paris to the bleeding cavity.

Though he was not acquainted with Dr. Rhodes, Dr. Kingsbury at once sent the following telegram to Williamsport:

Remove coagulated blood, apply stiff mixed, quick setting plaster Paris, pressing it well into the alveole, and keep in place by compress for forty-eight hours. If not too late will save patient.

Immediately on the receipt of the telegram Drs. Rhodes and Huntington applied the plaster and telgraphed Dr. Kingsbury that the patient was doing well. Yesterday the two Williamsport dentists wrote Kingsbury a letter of thanks for his prompt suggestion and gave the following account of their treatment.

In the afternoon we used plaster Paris, covering the whole left alveolus and teeth, using gutta percha base plate for a compress. This worked well till Monday when it became cracked and blood oozing through we removed it, thoroughly cleansed and disinfected his mouth excepting the tooth cavity, when it was found that the bleeding had entirely ceased. The patient then took a glass of milk and egg and a drink of water, and for safety we replaced the plaster, but at 1 P.M. his stomach became disturbed, probably from the doctor's medicine, and in vomiting the plaster became broken. We were called; removed it, cleaned the mouth, found no bleeding, gave nourishment and replaced the plaster, hoping it may not be necessary to do so again.

Frick's father bled to death at the age of 63 from the extraction of a tooth, and his son bled for a week two years ago from the same cause. Some time ago the present patient bled six weeks from a cut in the hand. *Philadelphia Press.*

A CHEAP MATRIX.—Recently I have been successful with a matrix which I think will be of value to dentists who do not make gold crowns, and for patients who cannot pay for them, but who are willing to pay a moderate fee for saving badly decayed and broken molars. It is made from the composition silver strips that come for polishing between the teeth. One of the proper width is selected and cut a little longer than the circumference of the tooth to be treated. It is bent around it with the fingers and the ends punched together with a pair of pliers, drawing it tight. It is then removed and placed on a mandrel. My mandrel is a round steel 7 in. long, $\frac{5}{8}$ in. in diameter at the large end, and $\frac{1}{8}$ in. at the small end.

The ends of the band are folded over similar to the way a stove pipe seam is made. If the fold is not strong enough to hold, dip a piece of No. 60 tinfoil in soldering fluid, lay it on the seam, and hold it in the flame of an alcohol lamp. It will be soldered. Adjust the band on the tooth. If it fits, have the patient to close his mouth to see that the articulation is all right. Now if the tooth is all prepared fill with amalgam. When full take a wad of cotton and press the filling with it—using the thumb. It will make the filling very compact, and bring the surplus mercury to the surface. Do not remove

the band, but instruct the patient to call the next day or week and have it taken off. What I claim for this matrix is, it can be left on the tooth till the filling is hard. It is not expensive or hard to make. It is unequaled in filling large cavities with thin, frail walls by grinding down the walls and building the filling up over the edge, making the whole grinding surface of the tooth amalgam.

Peoria, Ill.

W. SLOAN.

PREVENTING PLASTER ADHERING TO THE CASE.—I noticed in your February number a suggestion is made to “use liquid silex over the tinfoil with which a model is coated, to prevent the plaster adhering to the case.”

My experience is that liquid silex is about the worst article possible to promote the adhesion of plaster to a place.

To overcome this difficulty, I find tinfoil No. 5 secured to the model with gum composed of equal parts of gum acacia and gum tragacanth, good; smooth the foil down nicely with the gum brush. On removing the investment the palatine surface of the case will be found nice and smooth. Should it be necessary to remove the tinfoil it may be done by pouring a small amount of mercury on the plate, brushing this well over the surface with cotton wool, when it is well amalgamated; pumice and a brush wheel on the lathe will do the rest.

Another way to remove the tin is to put the case in a pickle of nitric acid 1 part, water two parts, this will soon remove all the tin, I prefer the latter method. I also notice the use of manilla paper to prevent the base plate sticking to the model.

A much neater and handier method is to rub French chalk well into the model while yet damp, with cotton wool; this will prove a sure preventative to either gutta-percha or wax sticking, and there will be no paper to soak off the base plate.

London, England.

W. MITCHELL, D. D. S.

DRINKING BEFORE MEALS.

“In the morning,” says the *Medical News*, “the stomach contains a considerable quantity of mucus spread over and adherent to its walls. If food enters at this time the tenacious mucus will interfere to some extent with the direct contact between the food and the stomach necessary to provoke the secretion of gastric juice. A glass of water taken before breakfast, passes through the stomach into the small intestines in a continuous and uninterrupted flow. It partly distends the stomach, stretching and to some extent obliterating the rugæ; it thins and washes out most of the tenacious mucus; it increases the fullness of the capillaries of the stomach, directly if the water is warm, and indirectly in a reactionary way if it is cold; it causes peristalsis of the alimentary tract, wakes it up (so to speak),

and gives it a morning exercise and washing. Care must be taken not to give cold water when the circulation, either local or general, is so feeble as to make reaction improbable. We should not risk it in advanced age, nor in the feeble, whether old or young, nor should it be given in local troubles like chronic gastric catarrh. In these cases it is best to give warm or hot water. The addition of salt is very beneficial. Such a time-honored custom as drinking soup at the beginning of a meal could only have been persistently adhered to because of it having been found by experience to be the most appropriate time. It does exactly what warm or hot water, with the addition of salt, does, and more, in that it is nutritive and excites the flow of gastric juice."

THE TREATMENT OF COLDS.

Dr. J. H. Whelan states in the *Practitioner* for March, 1887, that he has found a combination of belladonna, quinine and arsenic almost a specific in aborting common colds if commenced in the early stage of the affection, while it is still confined to the nose and pharynx. The formula which he uses is the following :

R. Quininæ sulphatis, gr. xviii.

Liquoris arsenicalis, m xii.

Liquoris atropinæ, m i.

Extracti gentianæ, gr. xx.

Pulveris gummi acaciæ, q. s. ut fiant pilulæ xii.

Sig.—One every three, four or six hours, according to circumstances.

Dr. Whelan states that at starting, one pill should be taken every three or four hours, and later on every six hours, and he believes that if a catarrhal subject has a box of these pills always at hand, he will almost invariably succeed in aborting a cold.

He does not profess to explain how his remedy acts, unless it be as a powerful nervine and general tonic.—*Therapeutic Gazette*.

LITTLE THINGS THAT KILL.

At various times the newspapers have warned the public against swallowing the seeds of grapes, oranges, etc., because of the danger of such substances getting into a small intestinal bag, or cul-de-sac, called by the doctors the *appendix vermiformis*. This is a receptacle formed at the junction of the large and small intestines, but its use or object no physician knows. It has been thought to be a rudimentary or incomplete formation—or possibly some meaningless survival of a lost anterior type. At any rate, its existence, while presenting no apparent "reason for being," as the French say, is, on the other hand a positive and constant source of danger, because of the liability of its becoming the receptacle of some undigested seed or other indigestible

substance. In that case it produces a state of inflammation, which, in nearly all cases, proves fatal. Fortunately, but few seeds among the great number so heedlessly swallowed seem to get into this little death trap — although anyone seems likely to lodge there. Perhaps more cases of the inflammation of the bowels than the doctors suspect may be, in reality, due to this obscure and disregarded cause. One sad case which to-day produces a feeling of deep regret among thousands, and which plunges a family into overwhelming grief, occurred in this city recently, in the lamented death of J. Robert Dwyer, the most esteemed adjutant of the governor's foot guard—a man whose place that corps cannot make good. His case so baffled the physicians that an autopsy was had, and that revealed a piece of peanut shell in the *appendix vermiformis*.—*Hartford Times*.

HOW FINGER NAILS GROW.

From the Medical Reporter.

The growth of the nails is more rapid in children than in adults and slowest in the aged. It goes on more rapidly in Summer than in Winter, so that the same nail that is renewed in 132 days in Winter requires only 116 in Summer. The increase for the nails of the right hand is more rapid than for the left; it also differs for the different fingers and in order corresponding with the length of the finger. It is most rapid for the middle finger, nearly equal for two either side, slower for the little and slower for the thumb.

ANTIDOTES FOR POISONOUS CHEMICALS.

Many serious accidents, says the *Moniteur des Produits Chimiques*, happen or may happen, in consequence of a loss of time in the application of remedies in the case or absorption of, or burning by, such poisonous chemical products as are commonly employed in the industries. The following antidotes are recommended: 1. For phenic, sulphuric, muriatic, nitric or nitro muriatic acids, creosote, tincture of iodine, or phosphorous, use the white of an egg well beaten up in water, and a teaspoonful of mustard in warm water. In case sulphuric, "nitric," or muriatic acid has been swallowed, it is necessary to take lime mixed with as small a quantity of water as possible.

2. For chromic acid, the chromates, and colors that have chromium for a base, the compounds of copper, and such preparations as have antimony for a base (such as tartar emetic), and the compounds of mercury and zinc, use the whites of eggs in abundance, and, as an emetic, mustard, which, however, is useless if the poisoning has been done by tartar emetic.

3. For ammonia, soda, potassa, the silicates, and the alkaline hydro-sulphates, use vinegar and afterward oil or milk.

4. For prussic acid and its salts, the cyanides of potassium and mercury, the sulphocyanides, oil of bitter almonds, or nitrobenzine, pour water on the patient's head or spinal column, and put mustard plasters on the soles of the feet and the stomach. Do not let the patient go to sleep.

5. For ether, petroleum, benzole, fruit essences, and concentrated alcohol, take strong mustard as an emetic, with much warm water, cold baths, and fresh air. Keep the patient awake.

6. For the compounds of baryta or lead, use mustard as an emetic, with warm water, Epsom salts or Glauber's salts in water.

7. For arsenic and its compounds, use mustard, and dialyzed iron with magnesia, and, afterward, oil, milk, or mucilaginous liquids.

8. For oxalic acid and its salts, use lime or lime water, and afterward castor oil.

9. For nitrate of silver, use kitchen salt dissolved in water, and mustard as an emetic.

10. For the nitrous fumes from the manufacture of nitrate of iron, or of sulphuric acid, take acetic acid, as strong as can be endured, in small quantities at a time.

Scientific American.

Don't Measure Your Work by Your Pay—Always Do Your Best.

From the Chatauquan.

It is very common for young men, I think, to determine the quality of their work by the price which they are paid for it. I only get, says such a one, \$5 a week and I am sure that I am giving \$5 worth of service; if my employer wants more let him pay more; if he wants better let him give better wages. This is specious reasoning, but it is false; and it is destructive to the best work, and therefore to the best manhood. No man can afford to do anything less well than his best. He who always strives to do his best work, in the very process of striving will grow better and better. Not only will he grow more skillful in that particular workmanship, but he will be better equipped for other workmanship. This is an absolutely universal law. It is the absolutely universal road to promotion.

The man who is careful to give nothing more than he gets, rarely gets more than he gives. The man who works for his own sake, who puts the best part of himself into every blow that he strikes, who mixes all his work with brain and conscience, who studies to render the largest possible service regardless of the compensation which it brings, sooner or later will find his way on and up. The world learns his worth and calls him to higher service. Nor is this all. By stirring himself up to do always the best he can, he grows into a power to do better and ever better.

HOW WE WALK.

The whole secret of standing and walking erect, consist in keeping the chin well away from the breast. This throws the head upward and backward, and the shoulders will naturally settle backward and in their true position. Those who stoop in walking, generally look downward. The proper way is to look straight ahead, upon the same level with your eyes, or if you are inclined to stoop, until that tendency is overcome, look rather above than below the level. Mountaineers are said to be as "straight as an arrow," and the reason is because they are obliged to look upward so much. It is simply impossible to stoop in walking, if you will heed and practice the rule. You will notice that all round-shouldered persons carry the chin near the breast and pointed downward.

"Youth."

TEST FOR SEWER GAS.

The presence of this poisonous gas in a room may be detected as follows: Saturate unglazed paper with a solution of one Troy ounce of pure acetate of lead in eight fluid ounces of rain water; let it partially dry, then expose in the room suspected of containing sewer gas. The presence of the gas in any considerable quantity soon blackens the test paper.

American Analyst.

LOOK OUT FOR BENZINE.

According to the *American Exchange and Review*, "it is a little known fact that hard friction can develop sufficient heat to inflame benzine vapor, especially if the surface rubbed be varnished with shellac." They had also been informed by a competent and truthful mechanical engineer that the head of a "soldering iron," which it is well known is far below "red heat," had, in his own experience, been sufficient to set fire to an escape of benzine vapor.

SINGULAR WAY OF REMOVING DIRT FROM THE EYE.

Dr. R. W. St. Clair writes in the *Medical Summary*: "A few years since I was riding on an engine of the fast express, from Binghamton to Corning. The engineer, an old schoolmate of mine, threw open the front window and I caught a cinder that gave me the most excruciating pain. I began to rub the eye with both hands. "Let your eye alone and rub your other eye;" this from the engineer. I thought he was chaffing me and worked the harder. 'I know you doctors think you know it all, but if you let that eye alone the cinder will be out in two minutes,' persisted the engineer. I began to rub the other eye, and soon I felt the cinder down near the inner canthus, and made ready to take it out. 'Let it alone and keep at the well eye,' shouted

the doctor pro tem. I did so for a minute longer, and looking in a small glass he gave me I found the offender on my cheek. Since then I have tried it many times, and have advised many others, and I have never known it fail in one instance (unless it was as sharp as a piece of steel, or something that cut into the ball, and required an operation to remove it). Why it is so I do not know. But that it is so I do know, and that one may be saved much suffering if they will let the injured eye alone and rub the well eye. "Try it."

Canabis Indica in one drop doses of the first dilution, night and morning, and continued for some time, is said to be a most valuable remedy in the treatment of persistent headache.

Place the thumb on the wart, and press it against the bone. Move the wart back and forth on the bone till the roots become irritated or sore, when the wart will disappear.

Exercise is best if taken in some employment for an object. *Begin* and *end* slowly. It is well to carry our exercise to the point of fatigue if the system soon rallies from it; but for health, no greater fatigue should be incurred than a night's rest will remove. To sleep well and gain strength, the body must be fatigued. *Health and Home.*

THE ORIGIN OF PETROLEUM.

Professor Medelejef has advanced the theory that petroleum is of mineral origin, and that its production is going on and may continue almost indefinitely. He has succeeded in making it artificially by a similar process to that which he believes is going on in the earth; and experts find it impossible to distinguish between the natural and the manufactured article. His hypothesis is that water finds its way below the crust of the earth, and then meets with carbides of metals (particularly of iron) in a glowing state. The water is decomposed into its constituent gases. The oxygen unites with the iron, while the hydrogen takes up the carbon and ascends to a higher region, where part of it is condensed into mineral oil, and part remains as natural gas, to escape where it can find an outlet, or to remain stored at great pressure until a borehole is put down to provide it a passage to the surface. Oil-bearing strata occur in the vicinity of mountain ranges; and it is supposed that the upheaval of the hills has sufficiently dislocated the strata below to give the water access to depths from which it is ordinarily shut out. *Scientific American.*

TO STICK LABELS ON TIN BOXES.

Use starch paste with which a little Venice turpentine has been incorporated while it was warm.

ARTICLES OF FOOD THAT ARE LAXATIVE.

Cracked wheat, oatmeal and Indian meal gruel, Graham bread, bran bread ($\frac{3}{4}$ flour, $\frac{1}{4}$ bran), new potatoes, green corn, turnips, onions, apple sauce, rhubarb and goosberries, stewed prunes, honey, molasses candy, fruits (oranges, apples, pears, peaches, plums, apricots), dried fruits fresh (raisins, figs, prunes, dates, tamarinds, dried apples, etc.), salad oils, porter, ale, cider, mineral water.

One of the best and simplest remedies for torpid liver or biliousness is a glass of hot water with the juice of half a lemon squeezed in it, but no sugar, night and morning. A person to whom this was recommended tried it, and found himself better immediately. His daily headaches, which medicine had failed to cure, left him; his appetite improved, and he gained several pounds within a few weeks. This is so simple a remedy that any person thus afflicted will do well to give it a trial, as it cannot possibly do any harm.

Scientific American.

THE HABIT OF INDECISION.

We would not disparage deliberateness and thoughtfulness wherever necessary. Great undertakings are not to be entered into without consideration. But it is the extremity of caution of which we are speaking, the vice of indecision, of never having enough strength of purpose or keenness of moral perception to determine what is right and what is wrong until all chance of doing any effective has forever passed. Emergencies rise along every line of life that require instant decision, and as instant action. There is no time for deliberation. A man must be equal to such occasions or prove himself a failure. It is the decisive man who fills his days and years with fruitful labor. It is often a source of wonder how certain men, moving under the heavy burdens of responsibility can give their personal attention to a great multiplicity of affairs, and discharge every duty satisfactorily, it is because they waste no time in undue deliberation. They do one thing at a time, and do it quickly. Such men are worth a host of fearful, timid, over-cautious souls for the execution of any undertaking. They will crowd more work into one day than an irresolute man would do in a month, and do it better, too. They will attack an enterprise and overcome it while the irresolute are skirmishing with the outposts.

Decision in action is a cultivated habit. It comes from having an aim to accomplish and a method for accomplishing, and then pursuing that method resolutely, bravely, determinedly to the end. First know you are right and then go ahead, is a good motto, but it is not best to spend all your time in trying to find out what is right

and never going ahead. Neither should you be frightened into a retreat by every cloud of danger, or halted by every whisper of distrust. There is a heavenly monitor in every man's breast, on which, if he will but listen, he may always rely. The trouble with the victims of indecision is, that they listen to every other voice but that of conscience. They listen in dread suspense to every whispered warning, but hear not the "still, small voice," that will surely guide them aright.—*Youth.*

A BIRDS SAVINGS BANK.

In California the woodpecker stores acorns away, although he never eats them. He bores several holes, differing slightly in size, at the fall of the year, invariably in a pine tree. Then he finds an acorn, which he adjusts to one of the holes prepared for its reception. But he does not eat the acorn, for, as a rule, he is not a vegetarian. His object in storing away the acorn exhibits foresight and a knowledge of results more akin to reason than to instinct. The succeeding winter the acorn remains intact, but, becoming saturated, is predisposed to decay, when it is attacked by maggots, which seem to delight in this special food. It is then that the woodpecker reaps the harvest his wisdom has provided, at a time when, the ground being covered with snow, he would experience a difficulty otherwise in obtaining suitable or palatable food.

CURIOSITIES OF MAGNETISM.

Most well-informed people are doubtless aware that the globe on which they live is a great ball of magnetism, but comparatively few have any adequate idea of the influence this property is continually exerting on all sides, and that many common but inexplicable phenomena can be traced directly to this source. Statistics go to show that in the matter of steel rails, as many as thirteen will become crystallized and break where they go to make up a railroad track running east and west, before one of those on a north and south track is similarly affected. This is entirely due to the magnetism generated by friction, and the fact that the polarity of the magnetic current is, in the former instance, resisted in the headlong rush of the train, whereas, in the latter case, it is undisturbed. Another strange effect of this peculiar and occult force, is that exerted on the watches of train-men. A time-piece carried by the conductor, running a train twenty miles an hour, however accurate it may be, will, if the speed of the train is increased to, say, fifty miles, become useless until regulated. The magnetism generated by the flight of a train may be said to be in proportion to the speed with which it is propelled; and the delicate parts of a watch, numbering all the way from four hun-

dred to one thousand pieces, and peculiarly susceptible to this influence by reason of the hammering and polishing they have received, are not slow to feel the effect.—*Youth*.

“CARELESS EDITING.”

We regret to see ourselves charged in the February (1888) number of the *Archives of Dentistry* with careless editing. The charge is well founded although the shortcoming is entirely unintentional. We believe in the justice of giving credit to the journals from which we make our extracts and think it well when our exchanges notice our dereliction in this respect. Whether the fault lay with us or with the “Printer,” (or his devil) we are unable and indisposed to say. In making gleanings, we generally write in pencil whence the gleanings were culled. It may be that we omitted to do this in our cullings from the “Archives” or it may be that the printer did not notice our credits. We are more pleased than agrieved that a notice of this kind is made, as it will make us more careful in the future, and should it occur again, will know exactly where to fix the blame. ED.

CORRESPONDENCE.

NATIONAL DENTAL ASSOCIATION, U. S. A.

The National Dental Association of the United States of America, will hold its next regular meeting at Washington, D. C., July 24, 25 and 26, 1888.

For this meeting, as for all former ones, the authorities of the Smithsonian Institution have kindly granted the use of the Lecture Hall of the U. S. National Museum.

All members of the Profession in good standing are invited to be present.

ART. II SEC. I OF CONSTITUTION.

The future membership of this Association shall be composed of dentists who may be elected upon application, which application shall be accompanied by credentials of membership in some State Society, or by a recommendation from five members of this Association or of his State Society.

R. Finley Hunt, D. D. S.,

Sec. N. D. A., U. S. A.

SOUTH ORANGE, N. J., FEB. 24, 1888.

MESSRS. JOHNSON & LUND, Philadelphia.

Having for some years used Pumice Stone ; in which I have made various castings. I take pleasure in recommending it as the best material I have ever seen for mould purposes. It will stand the heat of moulten steel.

For Dental purposes I would recommend that it be mixed with a suitable quantity of Glycerine containing an agreeable perfume, as it is then always ready for use. Use Lycopodium.

Dr. H. P. Osborn,
South Orange, N. J.

SELECTED ARTICLES.

MATRICES AND SEPARATORS.

BY THOS. B. WHEELER, D. D. S., CHICAGO, ILL.

The first matrix we can find record of was composed of pieces of wood and metal, such as broken files, etc., used to make a temporary wall for a decayed tooth. These crude appliances were used with the same object in view as the matrix of to-day, viz.—to keep the first layers of gold in position and making a simple cavity out of a compound. These matrices were used by wedging them between the cavity of decay and an adjoining tooth. This appliance was improved later by Dr. Louis Jack, of Philadelphia, who gave to the profession the well-known "Jack Matrix," which consists of a piece of steel, grooved on the side to be filled against, and is retained in position by a piece of wood forced between it and the tooth posterior or anterior as the case may be.

On account of its rigidity and non-yielding qualities a great many imperfect fillings have been introduced, and no doubt, the failures caused by this method led many in the profession to look upon it with disfavor. About thirteen years ago Dr. Robert Huey, of Philadelphia invented the first loop matrix ; he undoubtedly recognized the necessity of employing metal that would either spring or stretch, and with this in view, constructed a thin band of platinum about 35 or 40 gauge of different lengths. These bands were doubled at the ends and holes were punched for the reception of a screw, which consisted of a small bar of steel made with a thread and nut ; this was put through the holes in the band, the latter was drawn around the tooth to be filled ; this had the advantage of being thin and flexible, so that the filling material could be forced between it and the margins of the

cavity, which was not permissible with the Jack matrix ; also it was not necessary to have an adjoining tooth to keep the appliance in place.

Since that time a number of matrices have been offered to the profession, some possessing considerable merit while others are nearly worthless ; in glancing at the list thus far there has been but few improvements over the Huey matrix, and they are nearly all based upon the same principle.

The Brophy and Guilford matrices are different. Dr. Brophy's matrix is a continuous band and the Guilford matrix encircles about two-thirds of the tooth, having the advantage over others that it is only placed between the teeth to be filled, for sometimes the teeth are so crowded that it is painful to force anything like a steel or platinum band in the extra spaces.

In regard to filling materials used, I have only to say that if you wish a failure in matrix-filling use cohesive gold at the margins or the beginning of your filling, and you will be called upon in a very short time to refill the teeth.

Non-cohesive gold must always be used, combining it with tin if you wish; my practice is to prepare the cavity properly, making the grooves for anchorage as near the grinding surface of the tooth as possible and adjust the matrix ; then I roll gold and tin together, using No. 4 of each, adopting the method first brought to my notice by Dr. A. W. Harlan; these are rolled together, cut into pellets of suitable size, and the margin end floor of the cavity is covered with two or three layers of this combination, care being exercised to force a portion of the soft mass between the matrix and the margins, and it is necessary to have the proper instruments, otherwise the margins will be bruised and failure will result.

Beautiful contour work can be done by loosening the band, ordinarily the elasticity or spring of the matrix is all that is required.

I think there is no better way to demonstrate the difference between non-cohesive and cohesive gold, than by using it in this connection, and it is reasonable to suppose that if cohesive gold can not be packed into the spaces between the matrix and tooth, it is not the kind of gold to use within the cavity walls. After the lining of tin and gold, the tooth should be filled about two-thirds full with non-cohesive gold, then finish with cohesive on the masticating surface.

Time and space forbids me the discussing of the many different theories of preparing cavities, and as this paper does not especially treat of that subject, very little will be said ; but one great advantage we have in matrix-filling is that it is not necessary to make grooves or retaining pits of any description in the floor of the cavity, thereby saving valuable tooth substance at the point where they should be

strongest. Another important factor, it is far less painful. After the gold has been inserted and the matrix removed, finish in the usual manner which does not require much time as there is very little surplus material to remove. I do not consider the Miller matrix superior to that of Dr. Jack's for the reasons that when wedged in place, it has no yielding qualities and considerable space is required between the teeth to insert it. It would be impossible to contour a filling with its use for it could not be removed after building the gold to the required contour, and in this respect the Jack appliance is preferable.

There has been so much written about separators that little remains to be said, Probably the best and most used at this time is the instrument invented by Dr. Perry. It is very valuable where space is required which can not be obtained by the ordinary methods of wedging. In that class of cases where the crowns of the teeth are very much larger than the neck, wedges of cotton, wood, or rubber can not be successfully employed without impinging on the gums, thus causing inflammation. The separator can be applied and slowly spread without causing severe pain and the space thus obtained is surprising. They are also valuable in separating teeth that have been filled without their use by simply applying the separator to procure space for proper finishing. They are also useful in cases where the teeth are loosened through any cause, as the pressure will hold them firmly while the gold is inserted, causing less pain to the patient and a better filling will be made. They can be used in connection with the Brophy and Guilford matrices.

I understand that a universal separator is being made that will replace the Parr and Perry instruments. There is a necessity for such an appliance, as those now in use can not be employed with success in many cases, as the bows are not large enough to pass over the largest molar tooth.

Dental Review.

MY DENTAL CREED.

By J. B. HODGKIN, D. D. S., WASHINGTON, D. C.

I believe the etiology of dental caries is still a mystery.

I believe the etiology of pyorrhoea alveolaris is as vaguely known as that of phthisis pulmonalis.

I believe stopping the cavity of decay stops the decay.

I believe this may be better done with "judgment" than with gold.

I believe in Abbey's soft gold foil, hand pressure, for all simple cavities. I believe that where "judgment" says gold is very difficult of

manipulation, I have no right to take risks. It is my patients tooth, not mine.

I believe tin foil will save more teeth than any other filling material, and that in grinding surface cavities in soft teeth, tin and gold combined is better than gold alone.

I believe that in all approximal cavities in bicuspid and molar teeth, except those of the best quality, tinfoil at the cervix is the best safeguard against recurring decay.

I believe cohesive foil in the hands of two-thirds of the operators of the present day is a delusion and snare (always excepting W. H. Morgan, John C. Story and one other man).

I believe I have no right to inflict on my patient a fifty dollar filling if I do half a day's work, for the sake of showing what I can do, if a five dollar filling will save his tooth.

I believe in amalgam and plastics for deciduous teeth, in gutta-percha for young permanent incisors ; that amalgam is a good thing for grinding surface fillings ; that a plastic filling renewed from time to time is better in a soft tooth with a large cavity under twenty years than metal ; that recurrent decay is a more serious trouble than original caries, that amalgam should be of few constituents and one of these be copper ; that all approximal amalgam fillings are unsafe ; that front tooth amalgams are damnable ; that five years should be the minimum test of its behavior ; that amalgam is no good when placed under enamel as a support.

I believe that a tooth pulp is better in the tooth than out of it, provided it has not been exposed.

I believe of any tooth which has ached from pulp exposure, that that pulp will die within four years, no matter how treated, capped, or doctored.

I believe that zinc phosphate will kill pulps ; that oxy-sulphate of zinc is the best capping material ; any poison strong enough to kill a microbe or bacterium will kill the tissue on which that M. or B. is lodged ; that the germ theory of disease is the most fascinating romance of modern invention ; that any decomposing matter irritates living tissues ; that we do lots of things for our patients wisely and well without knowing why, except that it does good.

I believe that when a round gimlet will bore a square hole and a sunbeam can be made to describe a curve, that I can drill to the end of all roots. (I believe that John C. Story can make oxy-chloride stop short just at the end of the pulp canal, for he says so, and he never told a lie.)

I believe first of all in iodoform, in oil of cloves, in creosote a good deal and in carbolic acid a little ; in aconite and iodine and no pep-

per. I believe in local blood-letting, in saline purgatives ; and I *don't* believe in quinine for pericementitis.

I believe a good plate is better than most bridge-work ; that a band about a root is a questionable irritant ; that I ought not to promise too much for devitalized teeth ; that in some constitutions a pulpless tooth is irritating.

I believe in replantation of teeth with no promises to patients ; that we should let the *Younger* process of implantation be *older* before we take the exclusive right out of his hands to practice it ; that dry bones can only live by a *miracle* and, that dentists are not saintly enough to do such apostolic work.

I believe in Norfolk oysters, in hog fish, in Prewitt of Ky , in John C. Story and W. H. Morgan, but I don't believe all they say, and I believe if I had the industry of Old Point mosquitoes I should be rich.

I believe in the old Virginia gentleman, kindly, courteous, beneficent ; the few that are left are like our specimens of old coin, fast becoming uncurrent, because of too pure metal for our day and race ; to be spoken of to our children in the future much as we talk of Grecian statuary or Roman eloquence, a thing of beauty, and a joy forever.

And I believe in American Dentistry, in separate colleges for the education of dentists and I believe that medical men are no judges of dentistry or its needs. I believe that dentistry touches medicine at such occasional points as to make it well nigh isolated from that *science*, " falsely so-called ; " it is a good thing to know a few things in dentistry all the way to the bottom—if there is any bottom—better than to know a whole lot of superficialities in medicine. I believe in concentration of thought, of purpose, of work.

I believe it is time to stop.

Dental Review.

PULPLESS AND ABSCESSSED TEETH.

Dr. W. H. Dwinelle, in New York society. I have been in the habit of treating pulpless teeth and abscessed teeth ever since I came into the profession. My methods are simple, and I am willing to compare my success with anybody, I have two principles by which I am governed in treating teeth of this kind : The first is to get a vent, the second, drainage. These two principles have governed me throughout my professional life. After I have established them and washed the pulp cavities and disinfected them, I am then content to simply inject through the pulp cavity and the foramen of the tooth and through the gums, a solution of carbolic acid or creosote. If I can establish drainage, I can, in ninety-nine cases in a hundred effect a cure. I endeavor to aid nature in her efforts to dispose of foreign matter and if I have established this in the right degree, cure is sure

to follow. I believe in the efficacy of carbolic acid and creosote. I do not use creosote as much as I did formerly, because carbolic acid seems to be, in my hands, a most excellent substitute for it. I endeavor to keep the foramen in a normal state, or as near to that as possible. If I can get a small broach through it I am satisfied.

Many years ago, during my earlier career as a dentist, an incident occurred when all my efforts were tending to this. The idea struck me to use a hydrostatic process. Like Archimedes of old, I was ready to cry "Eureka." I adopted that system, and, after adopting it, I kept my canals free from debris. Into some canals I could not get a broach, because, as well known to us all, they sometimes diverge at almost right angles. I filled my broach with creosote or carbolic acid, stopt the canal with rubber, and there let it stay for a short time, and then with a blunt instrument I would press on it, and suddenly give it an impulse, and I was almost sure in every instance to find that the creosote had been injected to the extremity of the root, and to the gum through the abscess, as indicated by the white color. I have seldom been obliged to use these means twice to effect a cure, even in bad abscesses. I believe in creosote, and I believe in carbolic acid. I think they are, together and singly, among the best agents we have for stimulating the tissues, inducing granulation and effecting cure.

A few years ago I was in Cincinnati, in the office of Dr. Hunter. He had a large foramen to close, and it was not practicable, in his estimation, to close it in the ordinary way. It opened like a funnel, with the largest diameter at its extremity. Of course you cannot fill a tooth of that kind in the ordinary way. What did he do? He drilled a hole opposite the apex of the root and introduced a screw as a plug and then filled on the plug closing the root in that way.

Hydrostatic pressure I consider invaluable and I had never heard of it before discovering it myself. Others may have discovered it before or since, but I never had even heard of it till that time.

ODONTOGRAPHIC JOURNAL.

BLIND ABSCESS.

DR. W. H. ATKINSON, IN N. Y. SOCIETY.—A blind abscess should be treated like blind people. Give them eyes; give them vent. Open them up to the disinfecting influences of the air and what else you please. Hew down into it and clear out the passages, and don't you forget it. Let all your mugwumpian ideas of filling go by the board. Be sure you are right and go straight to effect your purpose.

What is disinfecting? What are antisepsics? We have heard a great deal about them. All the substances named are simply agents

that hold oxygen with a loose grip, so they can carry it into the territory where the greater vacancy exists and leave it on the ground. That is the sesame of the whole thing—this idea of holding the oxygen loosely and carrying it to the place in which it will do most good.

One thing that seems to haunt the minds of most of the speakers has not been clearly set forth—how to fill a root that is curved, the foramen of which is larger than the main canal. Our friend Dwinelle puts a hook up there, finds where the end of the root is, and takes a measure. I say measure so that you shall not go through the end, and then with a stiff wire bur, made a little shorter than the tooth, carry the material to place.

One thing more, and that is, do not be afraid of mischief coming about from microbes and those kind of things. Green apples give the boys the bellyache, and those disturbing elements, the microbes, they say, gives us the toothache. How much do we know about microbes? Do we know anything of their life history? Do we know anything of the results that will follow if we let them alone? Are they always poison, or do they sometimes do good? They say there must be microbes to make pus possible. Pus is dead blood. When the serum is killed it is not capable of being built into tissue. Suppose you have filled a tooth, and there comes a blind abscess, what have you got to do? Just cut right into the seat of the mischief; and let me say, gentlemen, if I never see you again, you had better cut fifty times when you do not need to, and then to forget to cut once when you do. When a pulp is dead you can cut through gum, alveolar wall and all, and be sure you are not doing mischief.—*Odontographic Journal*.

CONN. VALLEY DENTAL SOCIETY, AND MASSACHUSETTS DENTAL SOCIETY.

Institute of Technology, Boston, Mass. July 10th to 13th, Inclusive

The Connecticut Valley Dental Society and the Massachusetts Dental Society will hold a Union Meeting in Boston on the 10th, 11th 12th and 13th of July next, at the Institute of Technology.

All the Dental societies in New England will be invited to unite with them, so that the meeting promises to be the largest ever held in this part of the country.

The programs will be sent out by the last of June.

The work of the meeting will consist of essays, clinics and demonstrations in Dental Technics, and the presentation of invitations and improvements by members of the profession.

Essays and papers will be given on subjects of practical and theoretical importance.

Clinics will be given by prominent members of the profession.

Clinics will in all cases be limited to actual operations with the patient in the chair.

Under Dental Technics, will be shown methods of manipulation—process not require the presence of patients—preparation of materials and making of instruments by members of the profession.

Introduction of new inventions, the size of the meeting will offer a good opportunity to present appliances of new inventions. Those at a distance can send such with a brief description, and members will be appointed to present them at the meeting.

A full report of the meeting will be published in the professional journals.

Members of the profession and journals are requested to kindly extend this notice as far as possible. Those having matters of interest under any of the above heads are invited to bring them to the attention of the Secretaries of the different committees as given below.

In connection with the meeting will be held an Exhibition modeled after the "Medical and Surgical Exhibition of the International Medical Congress." Recognizing the connection of the dental profession with the arts and sciences, all persons having articles, instruments or materials for use in dentistry, or that can be made of use in any way, are cordially invited to exhibit them. A large hall will be used for this purpose, and no charge will be made for space. It will, however, be necessary for exhibitors who desire to show apparatus requiring water or gas to make their own arrangements with the janitor or treasurer of the hall.

The exhibition of motors will be a prominent feature.

The name and address of the exhibitors, with one line, descriptive of their exhibits, will be printed on the program.

Members of the profession knowing of manufacturers or dealers in new or interesting articles, are requested to send notice to the Secretary of Committee on Exhibits.

Secretary of Committee on Essays, DR. A. H. GILSON, 10 Temple Place, Boston, Mass.

Secretary of Committee on Clinics, DR. E. C. LEACH, 422 Columbus Avenue, Boston.

Secretary of Committee on Exhibits, DR. W. E. PAGE, Studio Building, Boston.

Secretary of Committee on Motors, DR. S. C. STEVENS, EVANS House, Boston,

Please reserve the above dates on your appointment book.

G. F. EAMS, M. D. D. S., 62 Trinity Terrace, Boston, Mass. Secretary Mass. Dental Society.

GEO. A. MAXFIELD, D. D. S., Holyoke, Mass., Secretary, Conn. Valley Dental Society.
Boston, Feb. 1st, 1888.

GALVANOPLASTIC TOOTH CROWNS.

DR. C. E. DIEHL, PITTSBURGH.

The galvanoplastic art introduces into the dental laboratory an entirely new method for the manufacturer of gold tooth crowns, which shall be in every detail fac-similes of the natural organs. A gold tooth crown, as made by the swagging process, is nothing more than a metallic ferrule, with one end closed resembling a lead-pencil top. Cusps struck up in dies and soldered to the ferrule do not give it a tooth-like appearance.

There seems to prevail, unfortunately, a wrong impression as to which are the most important features of a tooth.

The greatest efforts have been directed heretofore toward making the cutting or masticating surface resemble the natural tooth, at the expense of the more prominent features.

The cutting and masticating surfaces contribute little, if any toward making a tooth look real. We notice, in the teeth of elderly persons, the cups and cutting edges are much—in many cases altogether—worn away; yet the teeth present a perfectly natural appearance.

We have paid too much attention to the soles of the feet, neglecting the more important features—the face of the tooth, the neck, the curves from neck to cups, and lateral lines.

To imitate these lateral lines by the swagging process seems practically impossible. Because, the circumference of the tooth is smallest at its neck; consequently, if a swagging tool were inserted into the crown and the gold made to conform thereto, the tool could not be withdrawn.

To overcome such a difficulty and many others, we have recourse to the Hydroplastic Art: The art of depositing metal through the agency of dynamic electricity and suitable metal solutions.

In the manufacture of a gold tooth crown by the galvanoplastic method, care and some experience are necessary. Each operator must learn what his battery and solutions are doing; whether there is too little gold or too little cyanide of potassium in the bath and whether the current of electricity is too strong or not strong enough.

By carefully observing the actions of the bath, the operator will soon learn to interpret the signs which they indicate.

The first step as in other methods, is to get a perfect measurement of the root to be crowned. Next, to select a well-shaped natural tooth of porcelain crown, that will nearly fill the space which the finished gold crown is to occupy.

A mold is made of the natural tooth or porcelain crown in plaster of Paris; a two-piece mold will answer in nearly all cases. A casting

gate is then cut, the mould fitted carefully together and a tooth pattern cast of a suitable fusible metal.

The tooth pattern is then fitted into the space furnished by the bite for length, and to the measurement of the root. This is easily done.

The fusible metal tooth pattern is quite soft; an ordinary rubber scraper is the only tool necessary. Finish with a series of graded grit powders.

Bore a small hole into the top of the tooth pattern; do not let the drill pierce the cutting or masticating surface.

The hole is for the insertion of a brass or copper wire two or three inches long. The wire will answer for a handle. We are now prepared to put the tooth pattern into the various baths, providing the pattern is perfectly clean and free from any oil or grease. Too much care cannot be paid to cleanliness in all galvanoplastic operations.

The first bath is one of copper, made of a simple salt of copper, the sulphate for example, or a double salt of copper—the cyanide of potassium and copper. The formula will be given further on.

Fill a glass jar, holding about one pint, with the copper solution. Lay two copper rods across the top of the jar; attach to one by a copper wire, the positive pole of a galvanic battery, and to the other rod the wire proceeding from the negative pole—generally zinc. The little rods thus become, one positive the other negative.

The tooth pattern which is to receive the galvanoplastic deposit is suspended in the copper bath by the wire handle previously inserted from the negative rod, and is known as the cathode.

From the positive rod is suspended a plate of metal, such as the bath contains in solution, which at present is copper. This plate is known as the anode. It will be noticed that in a few moments the whole surface of the tooth pattern (cathode) will be coated with a fine film of copper, the thickness of which is entirely under the control of the operator. It is best, however, to allow the deposit to accumulate to the thickness of ordinary writing paper.

The copper-covered tooth pattern is now taken out of the copper bath, rinsed in clear warm water and transferred to a jar containing about one pint of gold solution. The little rods perform the same office as before, except the copper plate anode is dispensed with, and one of gold or platina substituted.

If the battery and solution is in harmony, metallic gold will be deposited on the copper-faced tooth pattern in a few moments. The process is continued till the required thickness of gold is attained.

It usually takes about twelve hours treatment to complete the deposition of gold. The time, however, is of little consequence, as the process goes on without much attention.

When the deposit is of sufficient thickness, the work is taken from

the bath, washed, buffed and burnished. The wire handle is now withdrawn, the crown carefully picked up with tweezers and passed rapidly to and fro in a vessel of boiling water. The fusible metal will melt and run out, leaving within the grasp of the tweezers a beautiful gold crown. If the crown is a little large at the neck, it should be replaced in the gold bath, with the outside of the crown protected from a further deposit by "stopping off varnish;" gold will then deposit on the inside, thereby reducing the diameter at its neck.

A galvanic battery may be made of almost any kind of elements, Smee, Daniell, Bunsen, Grove, Grenet, or Le Clanche.

COPPER SOLUTIONS.

No. 1.—Stir a quantity of carbonate of copper in water, add cyanide of potassium, till the liquid becomes colorless.

No. 2.—Water $12\frac{1}{2}$ parts, and cyanide of potassium, carbonate of soda, acetate of copper and bisulphite of soda, each $\frac{1}{4}$ part. Mix the acetate of copper in one-fifth of the water, add the water drop by drop at first. This salt is difficult to mix in the presence of a quantity of water. When the acetate of copper is dissolved, add the carbonate of soda. Add one-fifth more water and the bisulphite of soda. The liquid now becomes a dirty yellow. Add the remaining three-fifths of water and the cyanide of potassium. The result should be a colorless liquid. If after the cyanide is all dissolved and the liquid is not entirely colorless, the cyanide was not pure. To remedy the evil, add a little more cyanide. If we desire a perfectly limpid bath the solution must be filtered.

No. 3.—Sulphate of copper, 1 pound; and water, 20 oz.

This bath must always be kept saturated, new supplies of the copper salt must be added. This is best accomplished by suspending a muslin bag containing the salt, in the solution. The addition of sulphuric, acetic or citric acid increases the conductivity and specific gravity of the solution, at the same time improving it materially.

GOLD SOLUTIONS.

No. 1.—Chloride of gold, 1 part; and cyanide of potassium, 3 parts, distilled.

No. 2.—Phosphate of sodium, - - - 6 parts.
 Bisulphate of sodium, - - - 1 part.
 Cyanide of potassium and
 Metallic gold, each - - - $\frac{1}{10}$ part.
 Distilled or rain water - - - 100 parts.

The metallic gold is first reduced to a chloride.

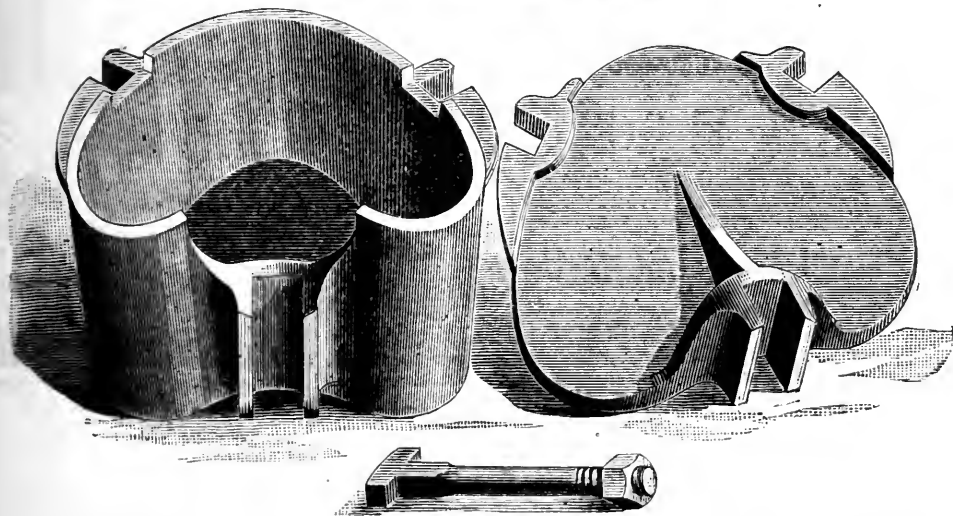
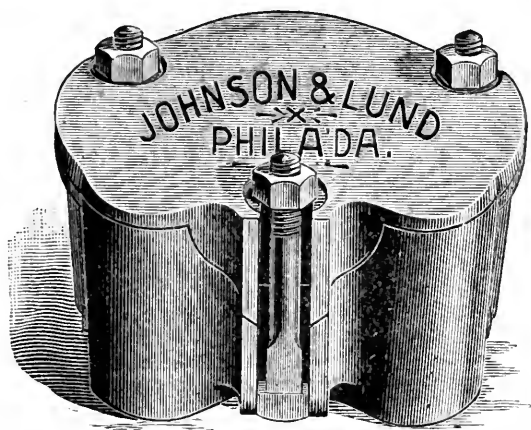
STOPPING OFF VARNISH.

Yellow wax - - - 7 parts.
 Resin (fine yellow) - - - 10 parts.
 Sealing wax - - - 4 parts.
 Peroxide of iron - - - 2 parts.

Chloro Gutta Percha.—Varnish of gutta-percha and chloroform will also do for "stopping off."

The surface of the anode should always correspond in size with the cathode.

DR. M. L. LONG'S
FLASK FOR VULCANIZING
 PARTIAL CASES AND REPAIR JOBS.



This flask is intended for partial cases ; cases where the tooth rests against the natural gum, temporary sets where no rim is intended to be on the outside and for repair cases of either vulcanite or celluloid.

For partial cases grind the teeth so they will rest against the model and secure them to the base plate. Fill the flask nearly full of plaster, and press the model, with the teeth attached to the base plate into this, until the plaster rises above the cutting edges of the teeth, which should be below the edge of the flask so that the cover will fit over without touching the teeth. The edges of the teeth should be at least a quarter not less than an eighth of an inch below the edge of the flask. The flask is intended for all cases where the packing of the rubber is done from the inside. When the model is buried into the plaster within the flask, the plaster that rises in excess is scraped off flush with a strait edge from the back to the front of the flask. The plaster is now made flaring so that what is added and adheres to the cover may part easily. When the plaster sets it is varnished and oiled, and plaster poured on and the cover set in place. When hard separate the parts, remove the base plate and all adhering wax around the pins of the teeth, pack and vulcanize. The same directions apply for repair cases.

Price Malleable Iron, - each, 75 cents.



1000 FINE

JOHNSON & LUND'S
DOUBLY REFINED

EXTRA TOUGH GOLD FOIL.

PHILADELPHIA 620 RACE ST. **DENTAL DEPOTS** CHICAGO 514 WABASH AVE.

COHESIVE. EXTRA-COHESIVE.
SOFT OR SEMI-COHESIVE.

Each Grade Uniform in Quality. Does not Ball up under the plugger. Its absolute purity is unquestioned.

Nos. 3 to 240.

Works with the utmost smoothness. Exhibits great softness under the burnisher. Possesses a wonderful amount of durability and toughness.

PRICE.

Per $\frac{1}{8}$ ounce,	-	-	\$4 00	Per $\frac{1}{2}$ ounce,	-	-	\$15 00
" $\frac{1}{4}$ "	-	-	7 75	" 1 "	-	-	30 00

Steurer's Plastic Gold.

We respectfully call attention to a new form of **Dental Gold**, that we have introduced to the profession under the name of "STEURER'S PLASTIC GOLD."

It is a chemically pure Gold in a plastic state, without admixture of any foreign substance, of a brown color and homogeneous appearance.

We claim the following advantages over all other forms of Gold heretofore used:—

- 1st. It is more cohesive.
 - 2nd. It has a spreading quality before it is completely condensed, so that it can be moulded into any cavity.
 - 3rd. A tooth can be filled in one-third of the time it takes with any other Gold, simple hand pressure being sufficient to make a solid filling, the mallet (which is so disagreeable to most patients) can be dispensed with, and sensitive teeth, or those whose walls are frail, can be easily filled.
-

Beware of worthless imitations. Be careful to see that it is in the shape of small square pieces, packed in bottles, and labeled *Steurer's Plastic Gold*, because the imitations, although they may apparently work tolerably in the commencement, do not make a solid filling, but gradually crumble away.

AS WE HAVE TO PAY CASH FOR THE GOLD AND THE MARGIN
IS SO SMALL, WE MUST SELL FOR CASH ONLY.
PLEASE SEND CASH WITH ORDER.

Price Per Bottle, 1-16 oz., \$2 50. Sent postage free on receipt of price.

JOHNSON & LUND,

DENTAL DEPOTS.

620 Race Street, Philadelphia.

514 Wabash Avenue, Chicago.

1,000 FINE

Extra Tough Gold Pellets.

Nos. 1-4, 1-2, 3-4, 1, 1 1-2, 2, and assorted

\$4.00 per $\frac{1}{8}$ ounce.

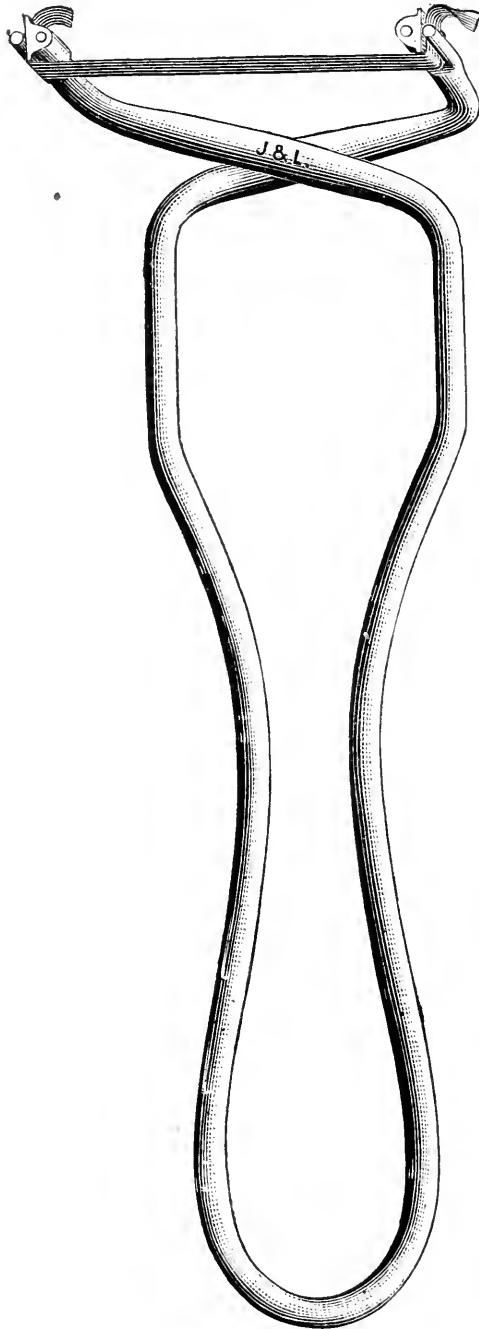
\$30.00 per ounce.

JOHNSON & LUND,

620 Race Street, Philadelphia.

514 Wabash Avenue, Chicago.

Dr. M. L. LONG'S POLISHING STRIP CARRIER.



Cut full size.

The above appliance will be found very handy in using polishing strips between the molars and bicuspid. All steel, nickel-plated.

Price, each, - - - - - \$1.75.

WATTS' CRYSTAL GOLD.

\$4.00 per one-eighth ounce.

JOHNSON & LUND,
Philadelphia and Chicago.

NERVE BROACHES

THE BEST

Assorted Sizes.

75 CENTS PER DOZEN.

NERVE PASTE.

Arsenic and Creosote.

35 Cents per Bottle.

SPUNK.

FOR DRYING OUT CAVITIES.

Price per oz..... 20
" in bulk, per lb.... \$1.25

SEPARATING FILES.

*J. M. EARNEST'S MAKE ARE THE VERY
BEST WITHOUT DOUBT.*

No. 000, per dozen..... \$1.25

All other numbers, per dozen. 1.00

JOHNSON & LUND.

THERMOMETERS.

For Vulcanizers.

THE MOST RELIABLE.

75 CENTS EACH.

PHENOL SODIQUE.

50 Cents per Bottle.

FLASKS FOR VULCANIZING

Malleable Iron, Each..... .75
Brass..... \$1.50

Orange Wood for Wedging.

Per bundle, 10 Cts.

DENTAL FLOSS SILK.

Price, plain, per dozen, . . . 75	Price, waxed, per dozen, . \$1.50
" " " spool, . . . 10	" " " spool, . 15

JOHNSON & LUND, Philadelphia and Chicago.

REDUCTION IN PRICE.

FRENCH

Separating Files.

" FROIDS."

Per dozen..... \$1.00

Shellac Sticks,

FOR

MOUNTING DISKS.

Per box..... 25c.

MEDICINE BOTTLES.

A small square glass bottle, with ground glass stopper, for Office Preparations. The stopper is flat on top to receive a label.

Per dozen..... 80 c.
Each..... 07 c.

It Retains its Brightness.

It works with great Plasticity, and packs densely.

Oz. Troy.

Extra Amalgam.

GOLD AND

JOHNSON & LUND
LABOR OMNIA VINCIT.

PLATINA ALLOY.

TRADE MARK.
JOHNSON & LUND,

SOLE PROPRIETORS,
620 RACE ST., PHILADELPHIA.
514 WABASH AVE., CHICAGO.

It possesses the greatest possible freedom from shrinkage.

Impervious to the Secretions of the Mouth.

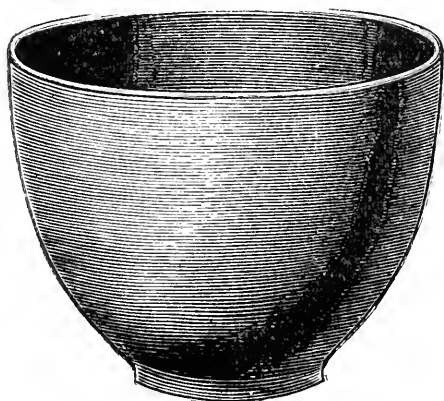
PRICES.

One	Ounce Package	\$ 3.00
Two-thirds	" "	2.00
One-third	" "	1.00
Two Ounces, purchased at one time	. . . . .	5.40
Three	" " " "	7.65
Four	" " " "	9.75
Five	" " " "	11.75
Ten	" " " "	20.00

When money accompanies the order, the Amalgam will be sent postage free.

REDUCTION IN PRICES.

RUBBER BOWL FOR MIXING PLASTER.



These bowls are made of soft rubber, almost one-eighth of an inch thick. They cannot be broken. Their sides can be pressed together so as to form a lip or spout for pouring out soft plaster. The plaster that remains in them and becomes set can be thoroughly crushed and removed by squeezing the sides of the bowl together.

Inside measurement, $4\frac{1}{4}$ inches in diameter by $3\frac{1}{8}$ inches in depth.

PRICE, 60 CENTS EACH.

POSSESSES THE GREATEST FREEDOM FROM SHRINKAGE.

oz. Troy.

EXTRA TOUGH GOLD AND PLATINA ALLOY

A notable Tooth Saver.

The proportions of Gold and Platina in this Alloy with the Combination of Silver, Tin, &c., cause it to harden quickly and to maintain its edge strength. Use as little Mercury as will make a stiff plastic filling, and place in cavity without washing.

JOHNSON & LUND,

SOLE AGENTS,

620 Race St., Philada.

514 Wabash Ave., Chicago.

WORKS WITH GREAT PLASTICITY AND PACKS DENSELY.

PRICES.

Per ounce	\$ 3.00
" half ounce.....	1.50
" two ounces purchased at one time.....	5.40
" three " " ".....	7.65
" four " " ".....	9.75
" five " " ".....	11.75
" ten " " ".....	20.00

When money accompanies the order, the Amalgam will be sent postage free.

Virgin White Alloy for Front Teeth.



The prominent qualities of this Alloy are its WHITENESS and FREEDOM FROM SHRINKAGE. Fillings made of this Amalgam, in tubes five or six times the diameter of those usually employed in the "leakage test," with blue or purple ink, give no perceptible indications of permeation of fluid. Though designed especially for front teeth, yet it will stand mastication well anywhere in the mouth. For crown cavities, however, we recommend the EXTRA TOUGH GOLD AND PLATINA ALLOY, as that is made with special regard to edge strength.

PRICES.

Per ounce	\$2.00
" half ounce.....	1.00
" two ounces purchased at one time.....	3.80
" three " " ".....	5.40
" four " " ".....	6.80
" five " " ".....	8.00
" ten " " ".....	15.00

When money accompanies the order, the Amalgam will be sent postage free.

IMPERVIOUS to the SECRECTIONS of the MOUTH.

IT RETAINS ITS BRIGHTNESS.

Dentists' Amalgam.

"Those things called dear are, when justly estimated, the cheapest."



It is composed of pure metals only. It contains no Cadmium or Bismuth. It will not discolor the teeth, or shrink from the cavity walls; in a word, it will not EXPAND, CONTRACT, or OXIDIZE. It requires LESS MERCURY in the process of Amalgamation than any other. For TOUGHNESS, STRENGTH, and RESISTANCE it has no equal.

Price, per Ounce,	-	-	-	-	-	\$5.00
" " Half Ounce,	-	-	-	-	-	2.50
" " Quarter Ounce,	-	-	-	-	-	1.25

"Prove all things, and hold fast to that which is good."

Metals, such as Cadmium and Bismuth, are not used in the manufacture of the DENTISTS' AMALGAM. This secures to the purchaser a greater bulk per ounce than in other Alloys.

This Amalgam having been thoroughly tested during the past quarter of a century and approved by the best practitioners, we deem it unnecessary to offer any of the numerous testimonials we have to sustain its already well-earned reputation.

JOHNSON & LUND,

620 Race Street, Philadelphia.

514 Wabash Avenue, Chicago.

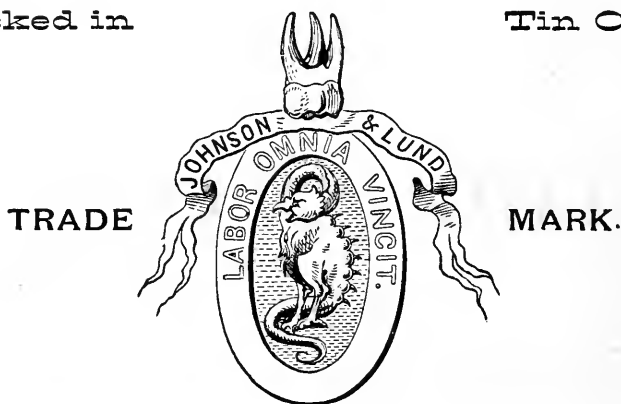
RUBBER DAM IN TINS.

1-2 Pound, \$1.50.

Extra Tough Coffer-Dam Rubber.

Packed in

Tin Cans.



Manufactured expressly for

JOHNSON & LUND,

620 RACE ST., PHILA.

514 WABASH AVE., CHICAGO.

We take pleasure in calling the attention of the profession to a new article of Rubber Dam, made in the most careful manner of the best Para Rubber, no adulteration being used in the manufacture, the Dam consisting entirely of Rubber, sufficient of sulphur only being used to properly vulcanize it. It is cut in strips $8\frac{1}{2}$ inches wide and from $3\frac{1}{2}$ to 4 yards long, being a very handy size for general use. It is packed in METAL TUBES, with a MOVABLE LID made as nearly AIR TIGHT as possible, in which the Dam can be kept, thus assisting very materially in preserving the strength of the material.

Price.

Per can containing $\frac{1}{2}$ lb.	Thin	per yard,	\$1.00
" " $\frac{1}{2}$ "	Medium	"	1.50
" " $\frac{1}{2}$ "	Thick	"	2.00

Sent Postage Free on receipt of price.

RUBBER DAM BY THE YARD.

35 Inches Wide. There is none made wider.

The Best Coffer-Dam Rubber.

Impossible to make any better. 35 inches wide.

The above Rubber Dam is made especially for us and to our own particular order, so that we know just what we offer to the profession, and what we know is, that it is impossible to make any better. Some time since we were obliged to buy some Coffer-Dam Rubber, which was advertised as a VERY SUPERIOR ARTICLE, to supply a customer who was impressed with the advertisement of the same. The result was that he found it tender, and returned it to us unfit to be used. We replaced it with our own, with which he was very well satisfied.

Thin	per yard,	\$1.00
Medium	"	1.50
Thick	"	2.00

CAUTION:

Much of the Coffer-Dam Rubber advertised by other depots and offered by their travelers is but $26\frac{1}{2}$ inches wide, is 20 per cent. less material to the yard than ours. For instance, our Medium 35 inches wide at \$1.50 per yard is as cheap as $26\frac{1}{4}$ inches of equal quality would be at \$1.12 $\frac{1}{2}$ per yard.

JOHNSON & LUND,

620 Race St., Philada.

514 Wabash Ave., Chicago.

HIGHLY IMPROVED MODELLING COMPOSITION

FOR

Taking Impressions of the Mouth, or any other Purpose
where a Perfect Impression is Required.



DIRECTIONS.—Soften the Composition in hot water, and when soft enough work into the desired shape with the fingers; place it in the cup, and then soften the surface with dry heat. This makes the surface softer than the main body. It takes a better impression, and hardens quicker. Should dry heat be used exclusively, wet the fingers occasionally to prevent the Composition from sticking. It is not necessary to oil the impression before pouring the plaster cast, as the Composition can be easily removed by immersing for a few minutes in hot water.

No. O.—EXTRA SOFT.—This grade is for restoring any of the other grades which have become hard by frequent use. They may be mixed in hot water.

No. 1.—SOFT.—This grade is for use in cold water and in tender mouths, and softens at a low heat; hardens in two minutes.

No. 2.—MEDIUM.—This grade is mostly used, and requires a higher heat to soften than No. 1, and sets quicker.

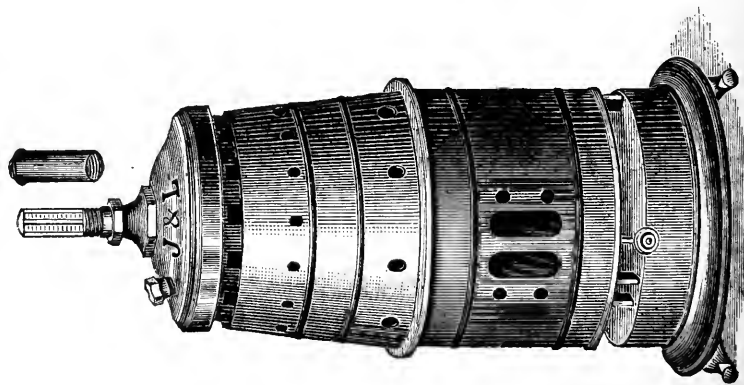
No. 3.—For use in hot weather; requires a higher heat to soften than No. 2, and hardens quicker.

No. 2 will always be sent unless other numbers are specified.

Price per Pound, - \$1.25. Per Half-Pound Box, - \$0.63.

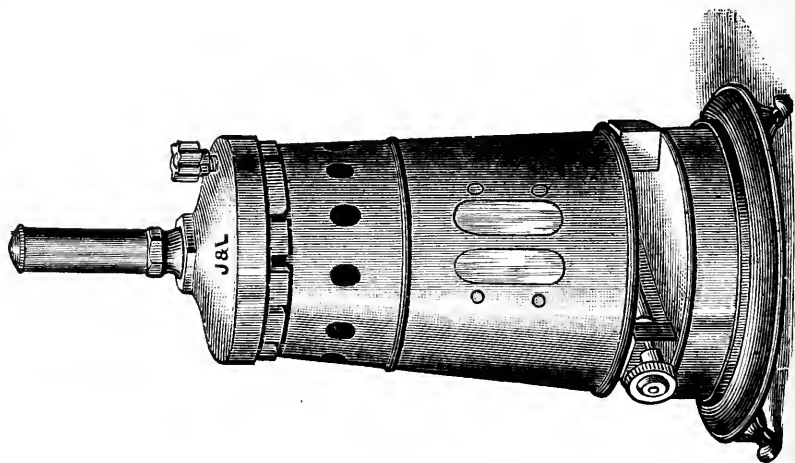
IMPROVED VULCANIZERS,

MERCURY BATH. BRASS, FLASKS, ETC.



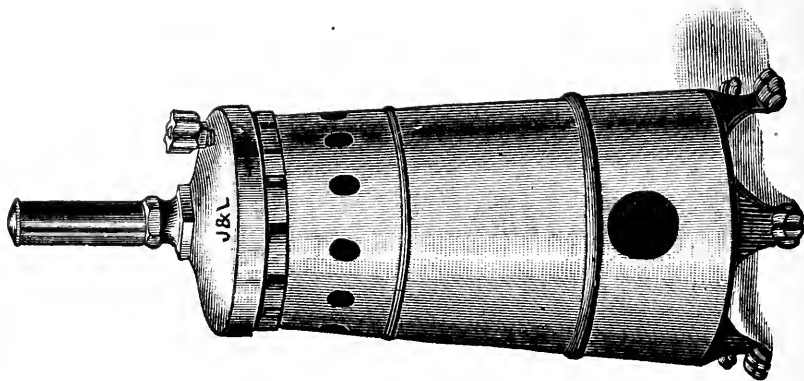
OUTFIT A.

Rigged for kerosene with Union stove.
One-case complete with Anchor Flasks, etc. \$14.00
Two-case ditto 15.00
Three-case ditto 16.00



OUTFIT B.

Rigged for kerosene with new attachment.
One-case complete with Anchor Flasks, etc. \$13.00
Two-case ditto 14.00
Three-case ditto 16.00



OUTFIT C.

Rigged for gas or alcohol.
One-case complete with Anchor Flasks, etc. \$13.00
Two-case ditto 14.00
Three-case ditto 16.00

Improved Vulcanizers, Mercury Bath, Brass Flasks, Etc.

These vulcanizers are made in the general style of the "Whitney." The boilers are of extra thick copper, and made much wider than those in ordinary use. The inside diameter of the JOHNSON & LUND Vulcanizer measures fully 4½ inches, while the "Whitney" and "Hayes" measure but 4 inches. The great advantage of this increased diameter will be appreciated at a glance, as it enables the dentist to use the largest size of flasks when necessity demands it. That the profession may be thoroughly satisfied of the ample strength of these vulcanizers, we assure them that each boiler has been tested by and sustained a hydrostatic pressure of 500 lbs., to the square inch ; and as the elastic force per lb. to the square inch at 320° Fahrenheit (the degree at which dental plates are generally vulcanized), is but 88 lbs., our Vulcanizers are capable of resisting more than six times the strain required. But this liberality of resisting power is no excuse for carelessness on the part of the operator.

Johnson & Lund's improved Vulcanizers are furnished with thermometer, mercury bath, one packing in place and an extra piece, extra disks for the safety-valve, requisite number of wrenches, malleable iron or brass flasks at option of purchaser. When no flasks are mentioned the brass ones will always be sent with the apparatus. We especially call attention to the flasks furnished with these Vulcanizers. They are of the pattern known as the **ANCHOR FLASKS**. Owing to their peculiar formation, an extra amount of room is afforded for the case to be vulcanized, and the bolts can be detached and replaced with great facility, without removing the screw from the nut.

PERIODS

Donham's Spring Pressure fitted to a Vulcanizer, adds \$1.25 to the Price.

NOTE.—The kerosene burner we are now furnishing with our Vulcanizer has but one burner; but that burner is four inches wide, instead of only two inches wide, which is the size of the burner belonging to the No. 1 Union Stove. This increased size makes the new burner equal to the two-burner stove, and at no increased expense.

stove, and at no increased expense.

One-case Vulcanizer, copper boiler, furnished with thermometer, packing jacket, lamp, disks for safety valve, two flasks (either malleable iron or brass, at the option of the purchaser), and wrenches—complete for alcohol	\$13 00
Ditto—complete for gas	13 00
Ditto—complete for kerosene	13 00
Two-Case complete for gas	14 00
" complete for alcohol	14 00
" complete for kerosene	14 00
Three-Case Vulcanizer—complete for gas	15 00
" —complete for alcohol	15 00
" —complete for kerosene	15 00
If the stove part is furnished with the kerosene burner, when sold in connection with the Vulcanizer, there will be an extra charge of	1 00

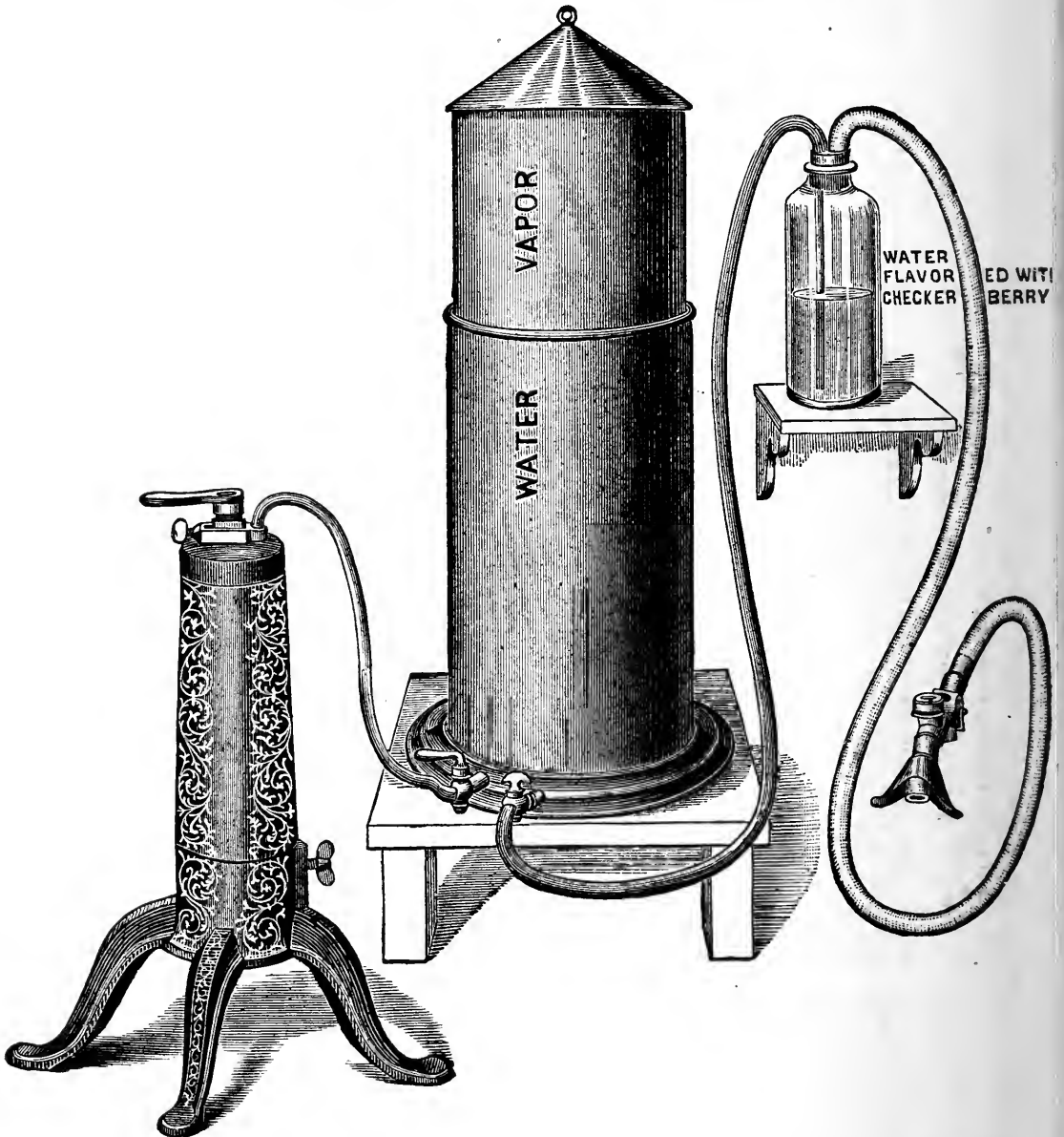
NOTE.—The kerosene burner we are now furnishing with our Vulcanizer has but one burner; but that burner is four inches wide, instead of only two inches wide, which is the size of the burner belonging to the No. 1 Union Stove. This increased size makes the new burner equal to the two-burner stove, and at no increased expense.		
No. 1 Union Kerosene Stove, with one burner two inches wide		\$2 00
" " " " four inches wide		2 25
No. 2 " " " two burners each two inches wide		3 00
Vulcan Gas Stove		1 50
NOTE.—We make no allowance where Vulcanizers with malleable iron flasks are ordered instead of brass ones.		

NOTE—We make no allowance where Vulcanizers with malleable iron flasks are used instead of brass ones.

tered instead of brass ones.

Two-Case Boiler, cover, thermometer, wrenches.	\$10 50	Round Wrench for Boiler	25	Felt Wicks for Union Kerosene Stove, 4 in. per doz.	\$1 00
Three-Case "	11 50	Straight "	25	Endless Packing, for J & L's Vulcanizer, each	05
Two-Case Boiler, without cover and thermometer	6 00	Flask Wrench	10	" "	05
Three-Case "	7 00	Raised Bed-Plate.	\$1 00	Ordinary "	05
Thermometer-Case and Tube, complete	2 00	Bed-Plate and Wrench	50	" " Whitney	05
Outside Thermometer-Case	50	" "	25	" " "	80
Inside "	50	Wrench, double end	25	" " Hayes	10
Cover, with Thermometer-Case and Thermometer	7 00	Felt Wicks for Union Kerosene Stove, 2 in. each.	05	Alcohol Lamp, for Vulcanizer	60
" without "	5 00	" "	10	Jackets	35
New Ring to Boiler	2 00	Canvas Wicks for Union Kerosene Stove, 4 in. each	06	Thermometers each	75
" Bottom to Boiler	2 00	" " "	60	Base, for either alcohol or gas	25
		Gas Burner for Vulcanizer	60		60
		Felt Wicks for Union Kerosene Stove, 2 in. per doz.	60		

A New Discovery. A New Discovery
FAR SUPERIOR TO LIQUID NITROUS OXIDE!
The Vegetable Anæsthetic.



It is without any of the objectionable features peculiar to other Anæsthetics. On the contrary, it builds up the tissues, quickens the circulation, and adds oxygen to the system. The properties of the herbs from which it is manufactured are hypnotic, diaphoretic, stimulative, and anti-spasmodic. The patient awakens from the sleep refreshed and cheerful, and reports the sensations and effects as most agreeable. It is given to the youngest children, the most sensitive persons, as well as the aged and enfeebled, and no injury has resulted, or in the nature of the Anæsthetic can result from its inhalation.

As an assurance of the safety and perfect reliability of this new Vapor, we publish the following recommendation from physicians and dentists who have been and are now using the new Vegetable Anæsthetic:

"We have used the Vegetable Anæsthetic since January, 1886—over a year—*exclusively* in our practice, both for the extraction of teeth and minor operations in surgery. We have administered it repeatedly in heart disease, severe lung diseases, Bright's diseases, etc., etc., where the patients were so feeble as to require assistance in walking, many of them under medical treatment, and the results have been all we could ask. No irritation, suffocation nor depression, and so pleasant to inhale—in fact, from its many good qualities, we can heartily recommend it to all as the Anæsthetic of the age, and should very much regret going back to the use of nitrous oxide gas and ether.

FRIZZEL & WILLIAMS, Dentists,
Lee Hall, Lynn, Mass.

The apparatus consists of a cylinder, gasometer, inhaling bottle and inhaler, together with the different sizes of rubber tubing necessary. The advantages of a gasometer over a gas-bag must be self-apparent. The Vapor left in a bag after an operation soon evaporates; but it will remain in a gasometer an indefinite time. It is much more convenient and always ready.

The bottle acts as an indicator, likewise a stop-valve. No vapor can escape through the water until inhaled, and should the patient stop inhaling, it is at once detected, as the faintest inhalation causes the water to bubble.

DIRECTIONS.—Fill the tank to within a few inches of the top with water; balance the upper part of gasometer so that a faint bubble will be forced from the water in the bottle. Fill the bottle with water sufficient to cover the end of long glass tube, and flavor slightly with checkerberry; change the water—say every 100 gallons of vapor used.

PRICES:

Gasometer, with double wall and spigot for waste water.....	\$13 00
100 gallon Cylinder, empty.....	10 00
200 " " " ".....	10 00
500 " " " ".....	22 00
100 Gals. Vapor. 2½c. per gal.....	2 50
200 " " " 2½c. ".....	5 00
500 " " " ".....	12 50
Connection.....	1 00
Indicator and Safety Bottle.....	2 00
Inhaler, Improved.....	10 00
Rubber Face Piece.....	1 00
Small Rubber Tubing.....per foot	16
Medium " ".....	25
Large Size " ".....	35
Tripod for 100-gal. cylinder.....	4 00
" " 200-gal. ".....	5 00
1 oz. Checkerberry.....	50
Boxing Extra.....	

Analysis of Vapor made by James F. Babcock, Analytical and Consulting Chemist, State Assayer and Inspector of Liquors, late Professor of Chemistry in Boston University and Massachusetts College of Pharmacy.

VEGETABLE ANÆSTHETIC CO.:

Gentlemen.—I have made a chemical analysis of a cylinder containing one hundred gallons of the Anæsthetic manufactured by your Company, and find that the same consists of a basis of nitrous oxide, combined with the volatile active principles of several well-known vegetable anodynes and sedatives, which are calculated to increase its efficiency. I find the Anæsthetic to be free from *chloroform* (which has sometimes been detected in compressed gas), and that it is likewise free from any dangerous or objectionable constituents. I cheerfully recommend this Anæsthetic to dentists and others as worthy of general confidence.

Respectfully, JAMES F. BABCOCK.

FOR SALE BY

JOHNSON & LUND,

620 RACE ST., PHILADA.

514 WABASH AVE., CHICAGO.

KNOXVILLE DENTAL DEPOT,

NO. 11 ASYLUM STREET, KNOXVILLE, TENN.

Where may be found a complete Assortment of Dental Supplies. I keep all
Dental Goods and Instruments Made and Handled by

Johnson & Lund,

M. M. HARRIS, Proprietor.

JAMES M. EARNEST,

MANUFACTURERS OF

Dentists' Files,

OF ALL DESCRIPTIONS.

NO. 2121 SARGEANT STREET, PHILADELPHIA.

Oct. 1888.

Birmingham, Ala., Dental Depot
2007½ Second Ave.

T. M. ALLEN, D. D. S., Proprietor.

Has constantly on hand a large stock of Johnson & Lund's Improved Artificial
Teeth, Extra Tough Rubber, Extra Amalgams, Onyx Cement, Lathes, Vulcanizers
Impression Cups, &c., &c.

N. B.—Special attention given to selecting teeth, when samples and models
are furnished.

CHAS. ABBEY & SONS,

DENTISTS' FINE GOLD FOIL,

Soft, or Non-Adhesive, and Adhesive.

ALL FROM ABSOLUTELY PURE GOLD.



230 Pear Street, Philadelphia.

January, 1889.

JOHNSON & LUND'S Improved Dental Lathe, No. 1.



In the construction of this Lathe we have introduced several novelties which only need to be seen to be appreciated. In the first place, one end of the spindle is made with a split-chuck and collar, which admits of the mandrels being changed with great facility, and insures their running true. The other end of the spindle is made taper to carry brush

wheels, felt wheels, &c. In the next place, the table, which is made of solid walnut and fitted with two drawers, extends about $1\frac{1}{2}$ inches further in the rear of the head than it does in front of it, thus furnishing the dentist or operator with a sufficiency of table room upon which to lay articles that it is desirable to have at hand. The driving-wheel is fifteen inches in diameter, and weighs 24 pounds. This great weight and enlarged diameter, in combination with the small size of the pulley, assures its running with great ease, power and rapidity.

The column of the Lathe, being hollow, permits of the Lathe rising and falling over six inches, thus allowing the cord to be tightened without taking it off. Accompanying the Lathe will be found three mandrels, fitted with screws and brass shoulders, one for each size of the threads fitted in Johnson & Lund's Improved Metallic Centre Corundum Wheels. There are also three brass chucks which screw on to one of the mandrels, for using with corundum wheels made without metal centres.

The Lathe is neatly painted and gilded, and is so beautifully modeled that it is quite an addition to the operating room, when it is desirable to use it in such a position. The Lathe is so constructed that it can be taken apart and packed in a very small compass. The spindle is fitted with an appliance to take up any lost motion.

For cuts of chucks and mandrels belonging to this Lathe see page 20 of adv. and note at foot of same page.

—o—

Price Complete, with Mandrels and Chucks boxed, \$17.00.

JOHNSON & LUND,

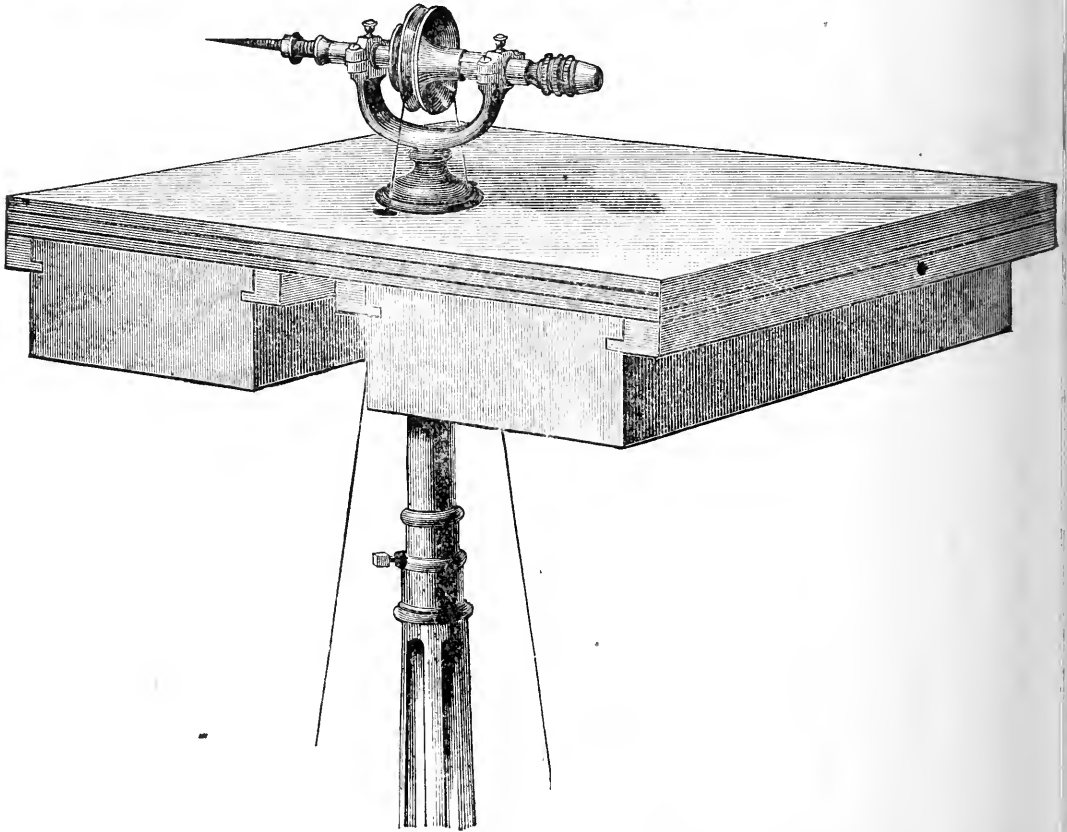
Principal Depot and Manufactory,
620 Race Street,
Philadelphia.

Branch Depot, 514 Wabash
Avenue, Chicago.

JOHNSON & LUND'S

IMPROVED

Dental Lathe, No. 2.



The stand and table of this Lathe are precisely the same as the stand and table of J. & L. Improved Lathe, No. 1. (See page 17.) The Lathe Head is an exceedingly fine article, the workmanship and materials being of the very best quality. The bearings are accurately fitted and so arranged that any lost motion which may occur by wear can be taken up with rapidity and accuracy. It is furnished with a cone screw on one end and a split chuck upon the other. The chuck is made with a cross-pin at the rear end, which is grasped by the split ends of the mandrels, thus giving them very long bearings. The oil-holes are covered with handsome metal screw-caps. The spindle and pulley-wheels are highly finished, and the framework is Japanned. The Lathe is so constructed that it can be packed in a very small compass.

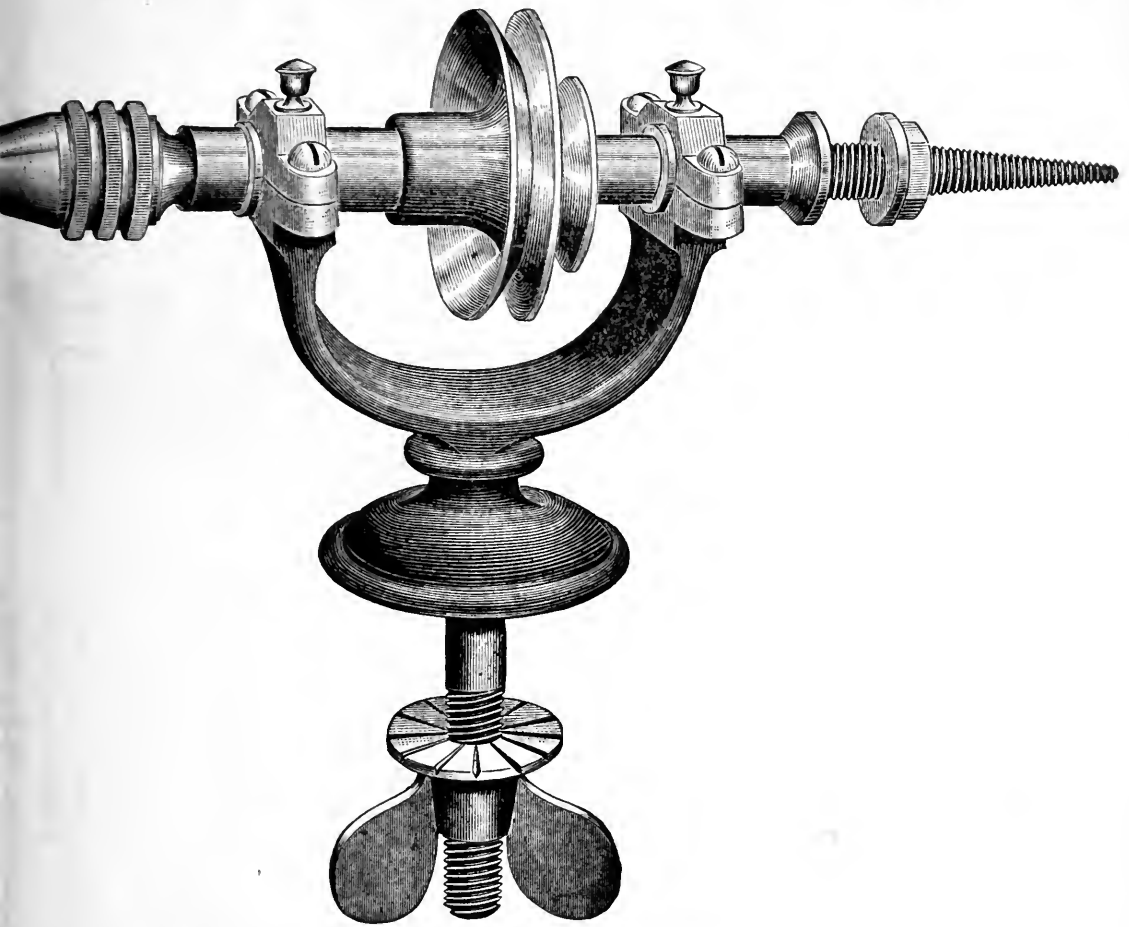
PRICES.

Lathe Complete, with ten Chucks	\$22.00
“ Without Chucks	19.00

For cuts of the ten Chucks and Mandrels, see page 20 of advertisement.

JOHNSON & LUND,

LATHE HEAD, No. 4.

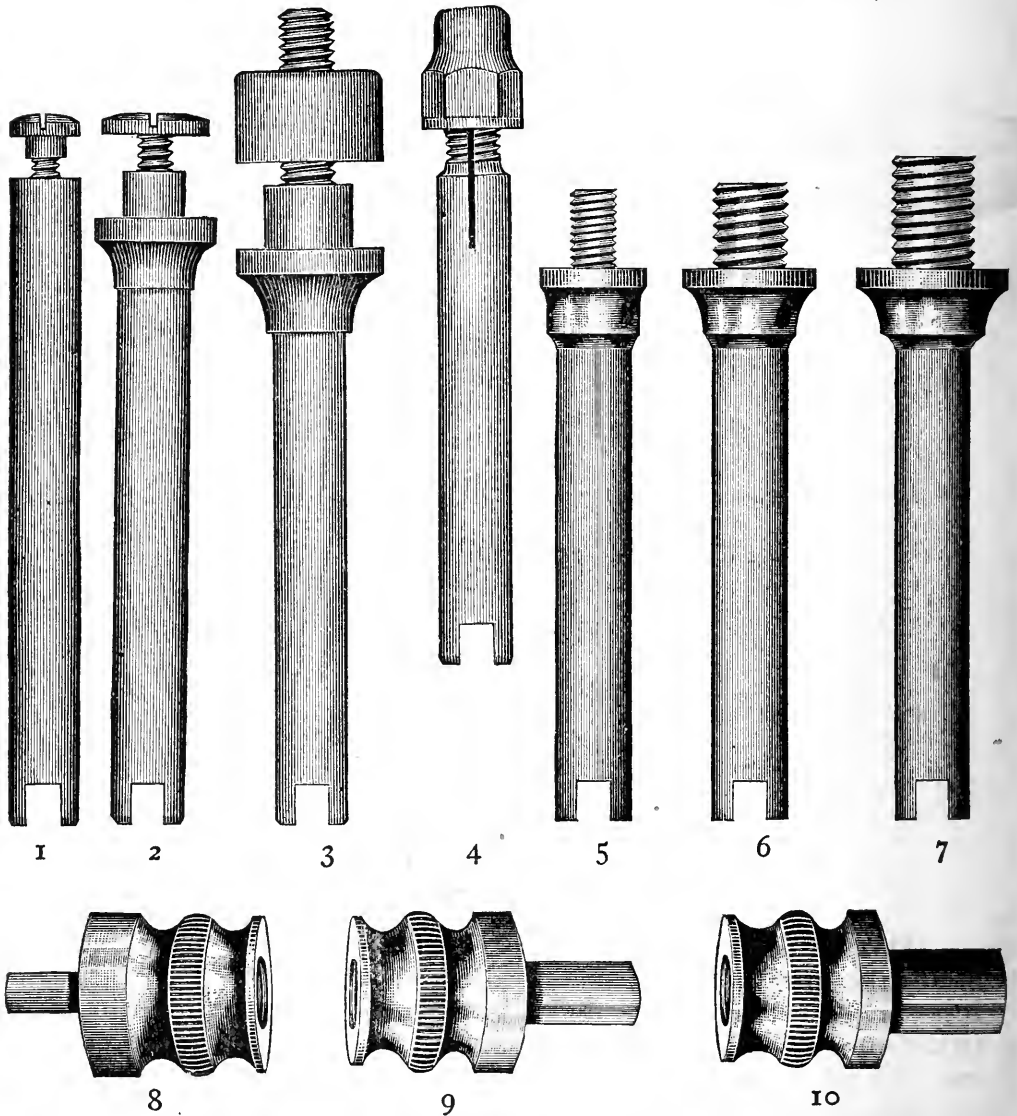


This Lathe Head, in connection with the Lawrence Driving Wheel makes the most complete and satisfactory Dentists' Lathe in the market. It is the best article of the kind ever offered. The workmanship and materials used are of the very best quality. The bearings are accurately fitted, and so arranged that any lost motion which may occur by wear can be taken up with rapidity and accuracy. It is finished with a cone-screw on one end and a split-chuck upon the other. The chuck is made with a cross-pin at the rear end, which is grasped by the split ends of the mandrels, thus giving them very long bearings. The oil-holes are covered with handsome metal screw-caps. The spindle and pulley-wheel are highly finished, and the frame-work Japanned. Ten chucks and mandrels are supplied with the lathe, if desired. For cuts of chucks and mandrels see page of advertisements and note at foot of page 20.

PRICE.

Head complete, with ten chucks	\$11.00
Head, without chucks	8.00

Chucks and Mandrels for Lathe-Head No. 4, and Johnson & Lund's Improved Lathe, No. 2.



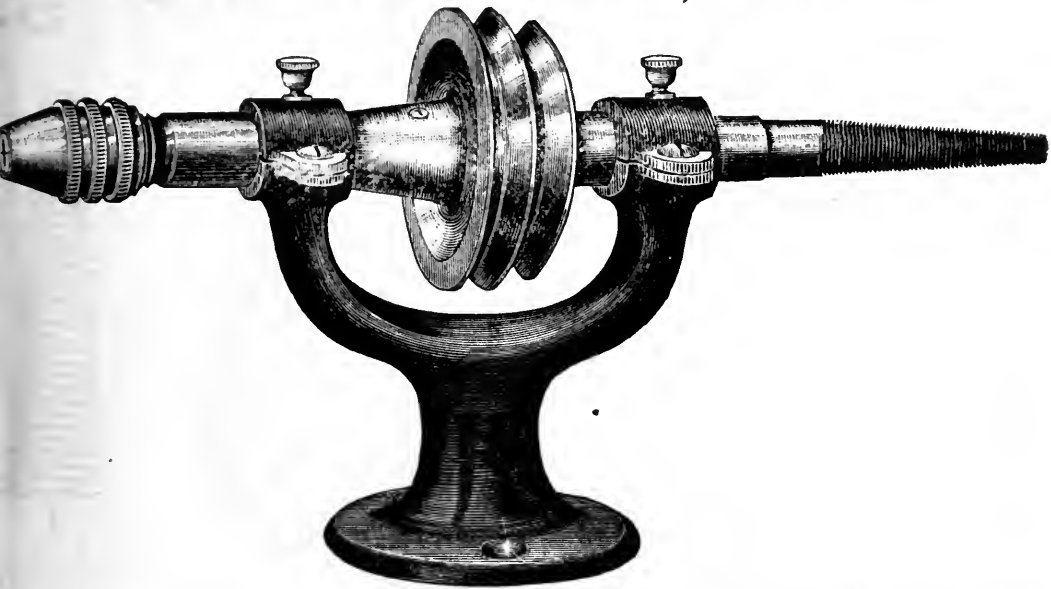
Nos. 1, 2 and 3 are screw chucks for corundum wheels, &c. No. 4 will carry engine burs, drills and tools. Nos. 5, 6 and 7 are screw mandrels for the improved metal-centre corundum wheels. Nos. 8, 9 and 10 are brass chucks fitting upon No. 7, and are intended for shellacing corundum wheels on.

PRICE.

Set of ten Chucks,	.	.	.	\$3.50
No. 1,	.	\$.30	No. 5,	. 35
No. 2,	.	. 45	No. 6,	. 40
No. 3,	.	. 60	No. 7,	. 45
No. 4,	.	1.00	No. 8, 9, 10, each,	. 25

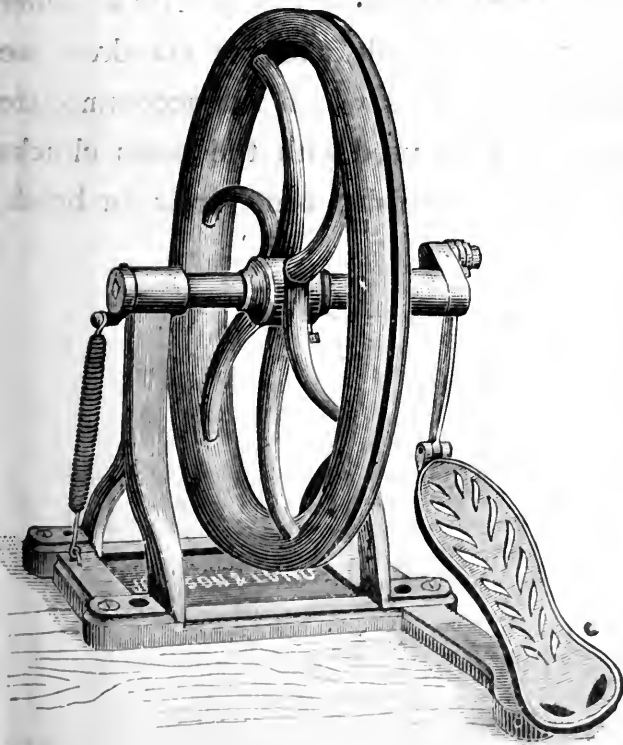
NOTE.—A set of Chucks to accompany Improved Lathe No. 1. Lathe Head No. 1 and Socket Lathe Head consists of Nos. 5, 6, 7, 8, 9, 10. Illustrated above.

LATHE HEAD, No. 1.



This Lathe Head is furnished with a split-chuck and collar, which allow the mandrels to be changed with great facility, and insures their moving true; the other end of the spindle is made taper to carry brush wheels, felt wheels, &c. Accompanying the Head will be found three mandrels fitted with screws and brass shoulders, one for each size of the threads, fitted in Johnson & Lawrence's Improved Metallic Centre Corundum Wheels. There are also three brass chucks, which screw on to one of the mandrels, for using corundum wheels made without metal centre. For the cuts of the mandrels and chucks belonging to this Lathe Head see p. 22 of adv. and note at bottom of same page. PRICE COMPLETE, WITH MANDRELS AND CHUCKS, \$6.00.

The Lawrence Driving-Wheel.

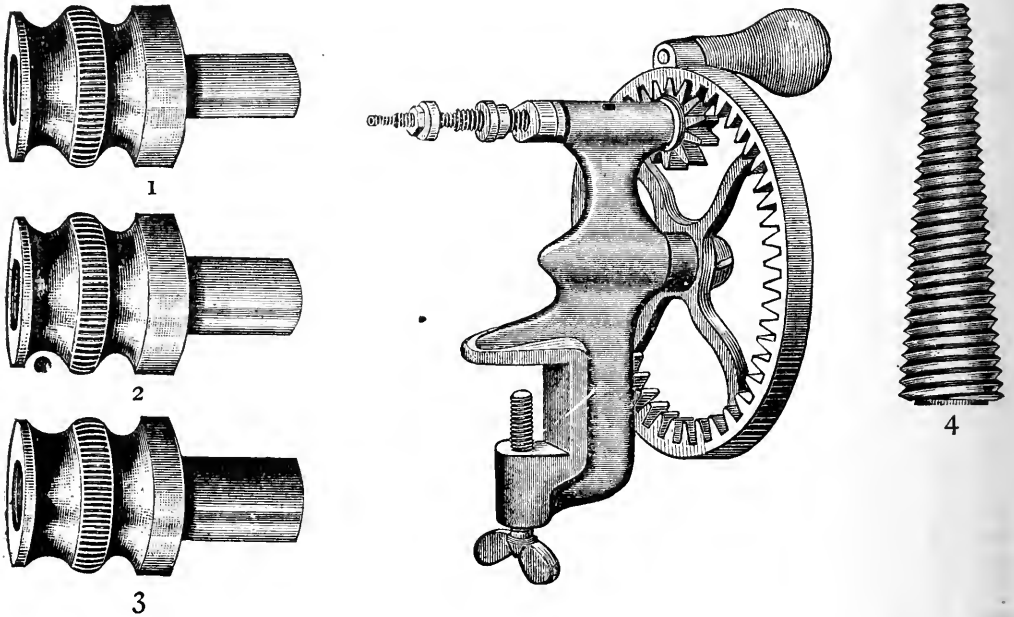


This is by far the most serviceable foot-power ever offered for general use to the profession. The Wheel measures $18\frac{1}{2}$ inches in diameter, and weighs 45 pounds. The entire apparatus is handsomely painted, and each wheel is furnished with a spring for the purpose of keeping the wheel, when at rest, off the centre and ready for action.

The cut is a faithful representation of the article itself.

Driving-Wheel . . .	\$11.00
Cord and Coupling . . .	.50

HAND LATHE No. 5.



The above cut represents a portable Hand Lathe for dental purposes. It is well made and weighs only 2 pounds, making it valuable for a traveling outfit. The Lathe is furnished at its shoulder with parting nuts for holding large wheels, and the mandrels are furnished with three different sized threads, which will accommodate any size of the metal centre—can be used with the brass chucks furnished with the Lathe. We also furnish a cone screw for brush, felt wheels, etc.

PRICE.

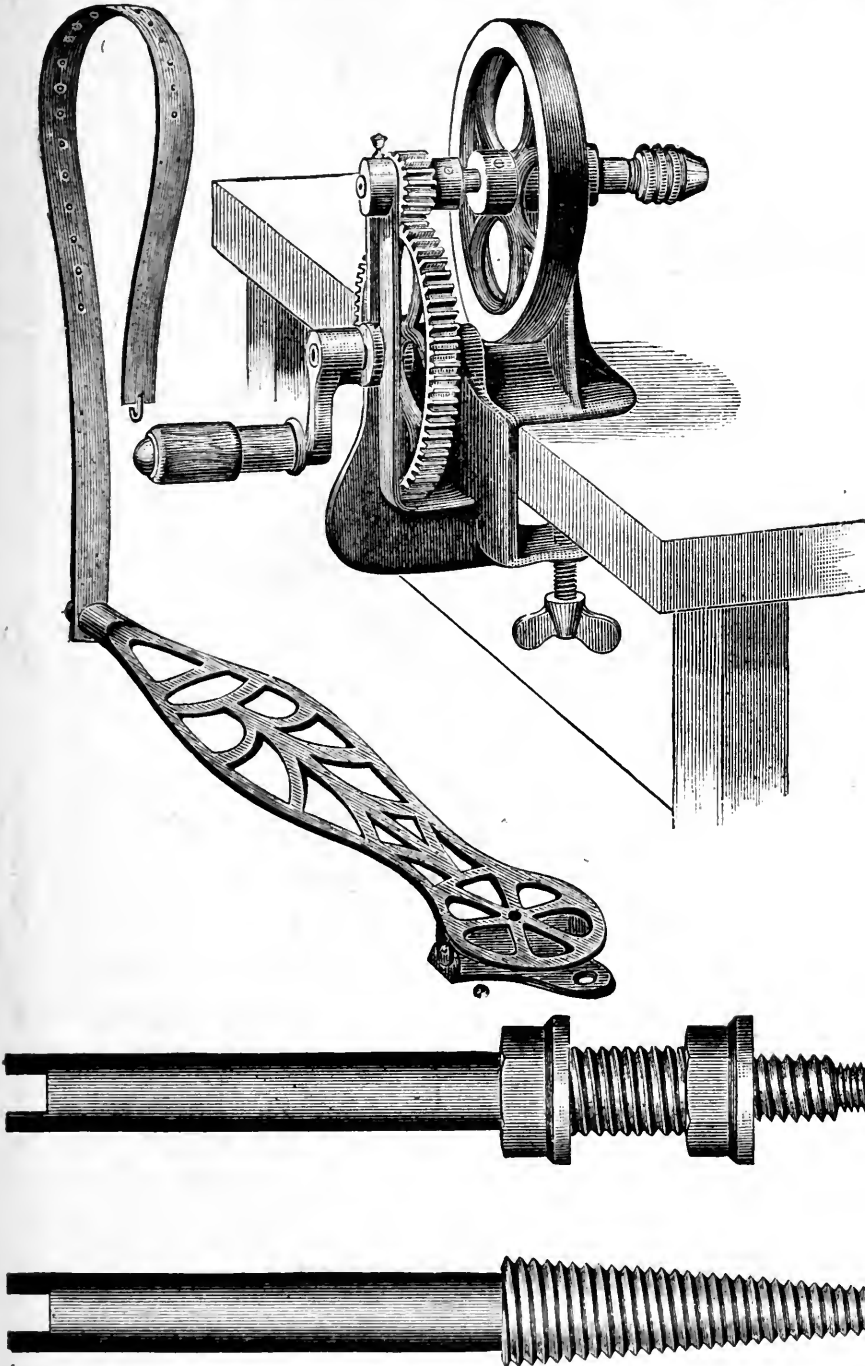
No. 5 Hand Lathe without Chucks	\$2.50
No. 5 Hand Lathe with Chucks	3.00
Extra Chucks, each . . . . .	.25

Johnson & Lund,

620 RACE ST., PHILADA.

514 WABASH AVE., CHICAGO.

HAND AND FOOT LATHE.



The above cut illustrates our HAND AND FOOT LATHE. It is made with a Split-Chuck similar to the one fitted to our Improved Dental Lathe and various Lathe Heads. It is furnished with a taper Mandrel for the accommodation of Brush Wheels, Felt Wheels, Cones, etc., and with a universal Mandrel which will fit any size of Corundum Wheel, Cone or Cup, made with the Improved Brass Centre, from the very smallest to the largest and thickest sizes. We also send with the Lathe three brass Chucks (illustrated on page 20 of adv.), which screw upon the Universal Mandrel for the convenience of those preferring to use Corundum Wheels without the metallic centre. The Lathe weighs, with two mandrels and three brass Chucks, complete, seven pounds and twelve ounces. The geared wheels are machine-cut, and the workmanship throughout is of the best description.

PRICE, COMPLETE \$6.50

Jacksonville, Florida, Dental Depot, No. 19 East Bay Street.

A. P. FRIES & CO., PROPRIETORS.

Dealers in JOHNSON & LUND'S Improved Teeth, Extra Tough Rubber, Crimson Brown Rubber, Jet Black Rubber, Light and Dark Red Rubber, Extra Amalgam, Onyx Cement, Johnson & Lund's Lathes, Vulcanizer Impression Cups, and a full line of Dental Goods generally.

Before purchasing elsewhere give them a call.



January, '88.

M. H. SPENCER & CO.,
195 AND 197 W. SEVENTH STREET,
CINCINNATI, OHIO.

DEALERS IN

Artificial Teeth and all Varieties of Dental Goods.

DR. CHUPEIN'S COPPER AMALGAM.

Copper amalgam is one of the best preservatives of the teeth except Gutta Percha. Its only drawback being its inability to hold its color in the mouth. As far as has been observed it neither contracts nor expands, but absolutely fills the cavity. It has considerable edge strength. While it turns to almost an inky blackness, it does not discolor the tooth bone. It sets very slowly, especially when used without squeezing the excess of mercury out of it, and it does not, on this account, seem to be applicable for contour work. It is applicable for back teeth in either jaw, and on distal surfaces; and particularly for **desperate cases**. While dryness of the cavity is always recommended, in cases where this condition is impracticable, it may be used with beneficial effect. It is the most economical amalgam, for the pieces left over may be re-heated, ground up and used until all is consumed. If on re-heating the pieces left over, it is found that they are crumbly or work too dry, it will only be necessary to add a very small globule of mercury to restore it to its plastic condition. Although composed only of copper and mercury, it does not seem to leave any metallic or coppery taste in the mouth. It does not appear to be so good a conductor of heat or cold, as either tin, gold, or the ordinary amalgams, and on this account may be used in cavities where the nerve is nearly exposed. Although this is not recommended, it being better in such cases to interpose a non-conducting material under all metallic fillings—still it may be done with success.

Full directions accompany each package.

PRICES.

One-half ounce package,	.	.	.	.	.	each, \$.75
One " " . . . . .	.	.	.	.	.	" 1.50

NEW STYLE BRUSH WHEELS.

Made of Horse Mane Hair. Grade between soft and medium soft. Very dense. Splendid polishers.

Letter.	Rows.	Grade.	Diameter.	Bristles.	Face,		Price.
A	6	Medium soft.	3 in.	Straight	1 $\frac{1}{4}$ in.	Each.	\$0.62
B	4	"	3 in.	"	$\frac{7}{8}$ in.	"	0.44
C	3	"	2 $\frac{1}{2}$ in.	"	$\frac{5}{8}$ in.	"	0.35
D	3	"	2 $\frac{1}{2}$ in.	Converging.	$\frac{1}{4}$ in.	"	0.35
E	4	"	3 in.	"	$\frac{1}{4}$ in.	"	0.44
F	3	"	2 in.	Straight.	$\frac{1}{2}$ in.	"	0.25
G	5	"	3 in.	Converging.	$\frac{1}{4}$ in.	"	0.25
H	6	"	3 in.	"	$\frac{5}{8}$ in.	"	0.62

CUP SHAPE.

I	2	"	2 $\frac{1}{2}$ in.	Straight.	$\frac{1}{2}$ in,	"	0.35
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JOHNSON & LUND.

620 Race St., Philadelphia.

514 Wabash Ave., Chicago.

DR. C. H. ECCLESTON'S

NAPKIN AND RUBBER DAM CLAMPS.

Upon the two following pages we take pleasure in illustrating Dr. C. H. Eccleston's Napkin and Rubber Dam Clamps and their uses. These clamps are designed more especially for clamping a folded napkin to the under teeth for temporary or minor operations. They are especially useful for operations upon children's lower teeth. The napkin thus clamped will, for a short time, enable the operator to keep the cavity dry and the tongue away from the tooth which is being operated upon, and avoid the necessity of using the rubber dam. The clamp can also be adjusted to the napkin and tooth without the aid of the clamp forceps, which is a very important feature. Dr. Eccleston has had them in use about three years, and has found them very handy and practical in all operations of the lower teeth, except long and difficult operations.

Below we give a general idea of the applications of the different Nos. of clamps—but the dentist must be governed by the exigencies of the case he has in hand.

No. 1.—For extra large permanent molars.

No. 2.—For small permanent and large temporary molars.

No. 3.—For small temporary molars.

No. 4.—For large cuspids and bicuspid.

No. 5.—For Small bicuspid.

No. 6 —For Incisors or very small bicuspid.

No. 7, 8 & 9 are intended to take the place of the old style thin band clamp, as they afford more room to the operator, and can be adjusted to the tooth and napkin with or without the ordinary clamp forceps.

PRICES.

Nos. 1 to 6, inclusive,	. . . . .	each, 70c.
Nos. 7, 8, 9,	. . . . .	“ 60c.

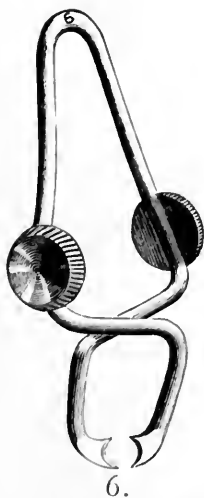
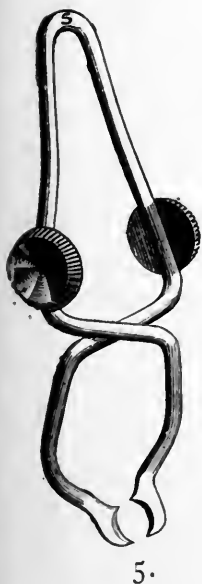
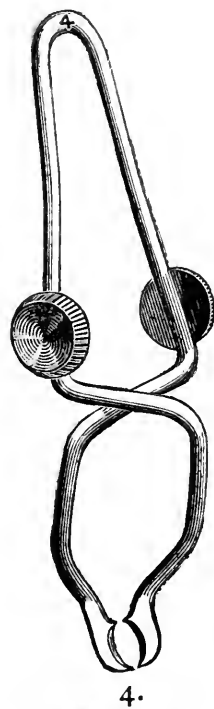
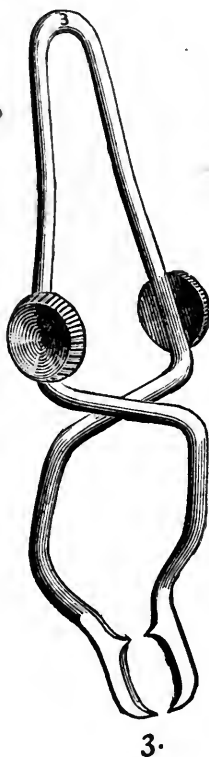
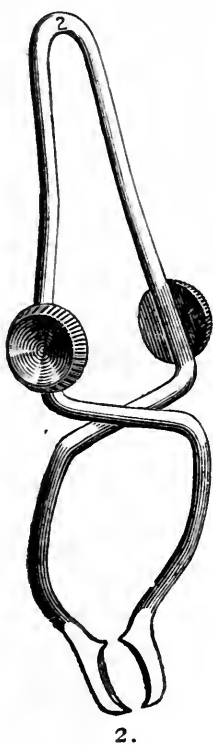
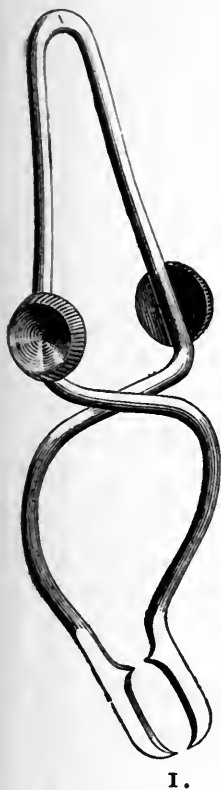
JOHNSON & LUND,

514 Wabash Ave., Chicago.

620 Race St., Philadelphia.

THE ECCLESTON NAPKIN CLAMPS.

DESIGNED BY DR. C. H. ECCLESTON.



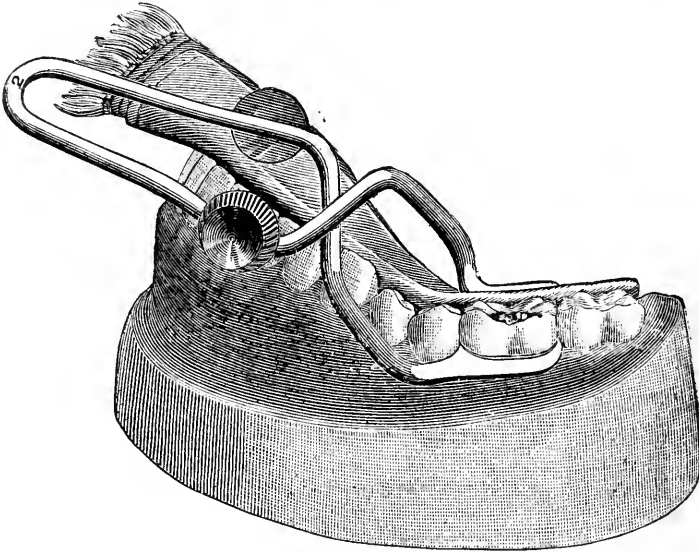
PRICE.

Nos. 1 to 6 inclusive, nickel-plated, each,	.	.	.	.	\$0.70
Nos. 7, 8 and 9, each	.	.	.	.	.60

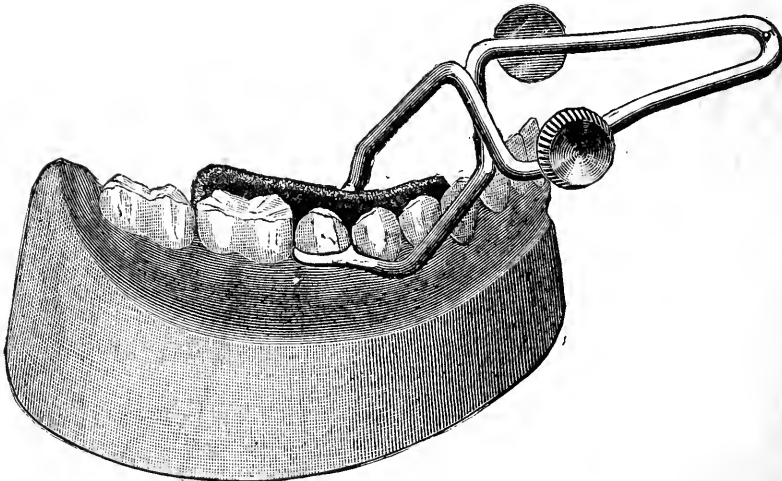
For description see page 26 of advs.

THE ECCLESTON NAPKIN CLAMPS

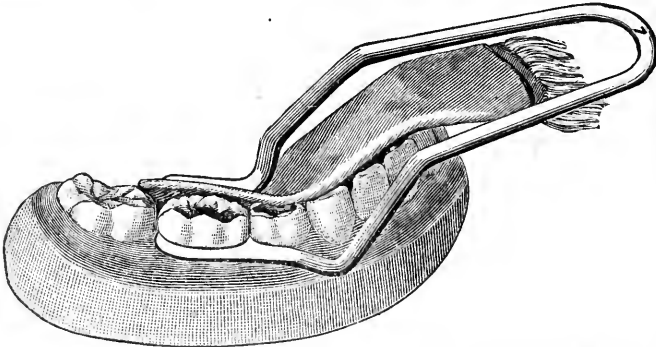
The following cuts show the manner of applying the clamps.



No. 2. clamp, clasp ing napkin to second molar.



No. 5 clamp clasp ing spunk or bibulous paper to second bicuspid.



No. 7 clamp, clasp ing napkin to second molar.
For description see page 26 of advs.

SHOVE AND DRAW CUT EXCAVATORS.

(SET OF 3.)

Designed by Dr. O. P. Lund.

These instruments are useful in reaching places which are with difficulty attained by the ordinary shapes, especially on the cervical margin of a cavity. The cutting edge is at such an angle that they can either be used with the ordinary motion of a hoe excavator or they can be shoved like an engraving tool. This is a decided advantage and with the different shapes of the set give great latitude in their usefulness.

Price per set of 3 engraved handles, nickel-plated,

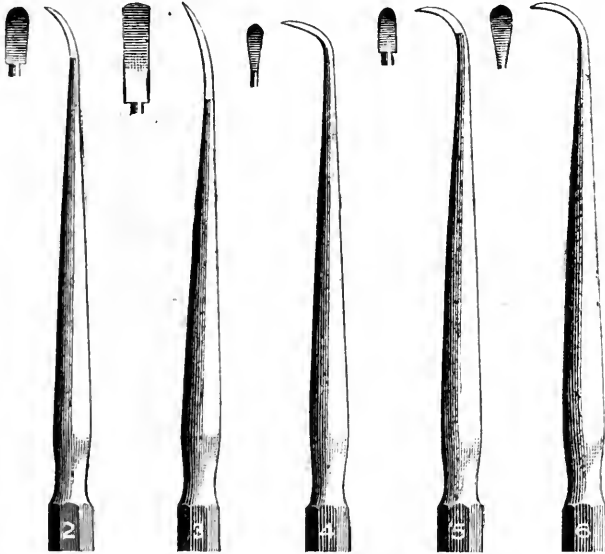
0.75

Each,

0.25

RAPID EXCAVATORS.

Designed by Dr. Charles R. Butler.



These instruments are designed for the excavation of large, open cavities where other means of excavating cannot be conveniently employed, they are made of the best quality of steel and tempered with a particular regard to their use.

Nos. 1, 2 and 3, cut from the operator; Nos. 4, 5 and 6, cut toward him. The forms are such as to readily suggest their application after the cavity is opened up with the enamel chisel.

Price, with plain octagon blued steel handles, per set

of 6, - - - - - \$2.75

Each, - - - - - 0.50

Price, with plain octagon nickel-plated handles, per set

of 6, - - - - - 3.25

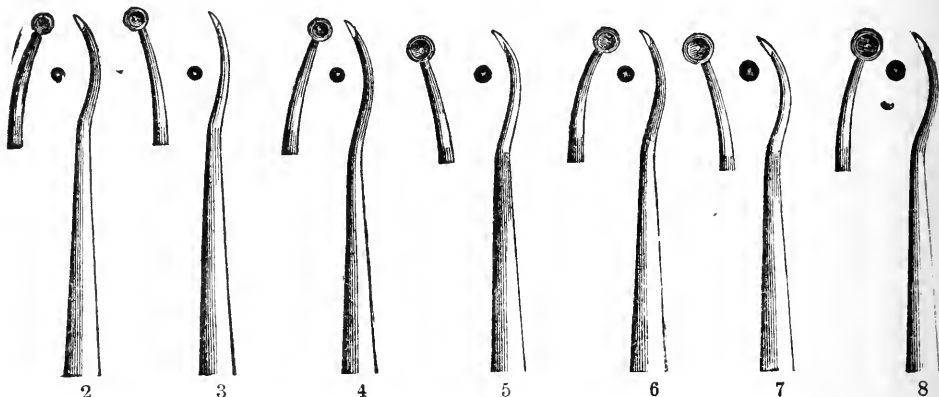
JOHNSON & LUND,

514 Wabash Ave., Chicago.

620 Race St. Philadelphia.

MERIAM'S RIGHT AND LEFT SPOON EXCAVATORS.

Designed by Dr. H. C. Merian.



These instruments are made without angles, but with very long curves which allow them to reach the cervical wall while following the shape of the tooth and presenting no obstacle to inspection. In deep cavities in molars either crown or buccal they will be found useful. They will also be found efficient in aiding the removal of soft decay from the pulp chamber in any tooth.

The stars in the engraving indicate that the instruments between which they are placed are rights and lefts.

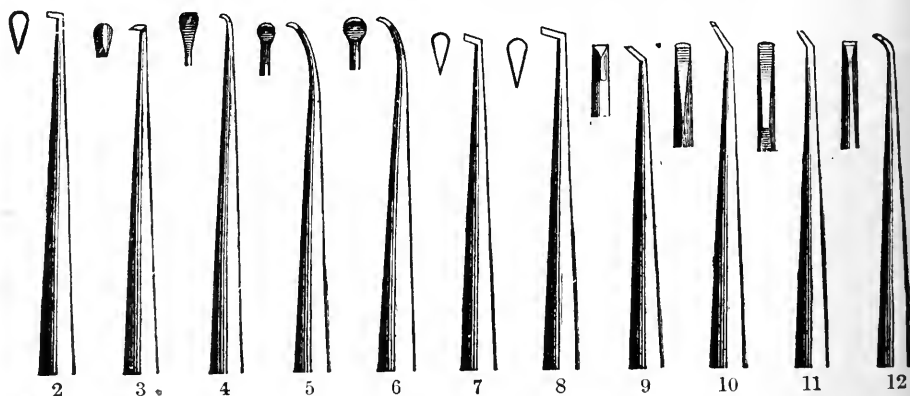
The small black spots show the *exact* size of the points of the instrument.

The sectional cuts show an enlarged view.

The most efficient manner to use these excavators is to hold them firmly in the hand with the thumb resting on the tooth, cutting toward it.

Price, with taper octagon steel handles, blued, per set of 8,	\$2.60
“ “ “ “ “ “ “ “ each,	0.33
“ “ “ “ “ nickel plated, per set of 8,	3.35
“ “ Engraved steel “ “ “	3.61

THE "BEST" EXCAVATORS.



The above cut consists of Dr. Corydon Palmer's six favorite points and the remainder of the set is made up of points suggested by various prominent dentists. They are of general utility, and are made of the best steel, and are of the finest workmanship.

Price, plain octagon, blued handles, per set of 12,	\$2.00
“ “ “ “ “ “ each,	0.45
“ “ “ “ “ nickel plated, per set of 12,	6.00
“ engraved “ “ “ “	6.00

JOHNSON & LUND,

514 Wabash Ave., Chicago.

620 Race St., Philadelphia.

THE HOPKINS NERVE CANAL REAMERS.

Designed by Dr. E. E. Hopkins.

They are very useful for enlarging the nerve canal prior to the permanent filling of the same; and Dr. Hopkins lays stress upon the progressive use of each reamer, beginning with No. 1, and following with the successive numbers

until the last number employed shall so enlarge the cervical opening that free access may be had along the entire course of the canal to its apical termination. The risk of breaking the heads of the reamers is reduced to the minimum, on account of the gradual increase in diameter, which almost entirely does away with the strain of the thin long shanks of the instruments. Angular access through lateral cavities in the crowns is permitted by the peculiar shapes of the sharp cutting heads. For size and shape of handles see Fig. 1.

Price Octagon Steel Handles, Blued, per set of 7, \$2.00
Each,30

Nerve Extractors.

Hook and Barb, Square Handles Blued. Drawn Temper, Made of the Best Quality, will follow the canal nicely.

Price, per doz., \$2.70
Price, each, .25

Nerve Probes.

Three sizes, Round Handles, Blued. No. 1. Largest. No. 2. Medium. No. 3. Small.

Price, per doz., \$2.00
Price, each, .20

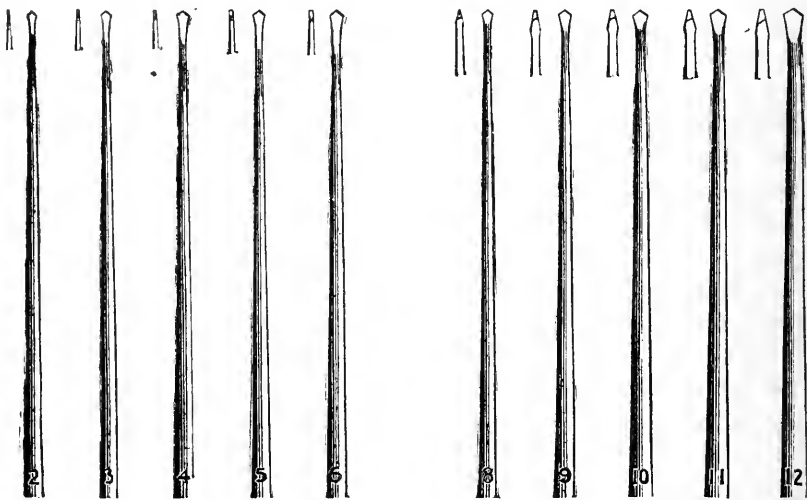
JOHNSON & LUND,

514 Wabash Ave., Chicago. 620 Race St., Philadelphia.

Nerve Extractors. Nerve Probe.

RETAINING PIT AND FISSURE DRILLS.

Designed by Dr. E. Pamley Brown.



Nos. 1 to 6 are for making Retaining-pits.

Nos. 7 to 12 are for opening hard enamel fissures in molars.

Having attained the requisite depth by drilling, it may be found advisable to enlarge the bottom of the pit and to countersink and burnish the margins to prevent the edges crumbling while filling, this is accomplished by imparting to the drill an oscillating motion.

The Retaining-pit drills are $8\frac{1}{4}$ inches and Fissure drills $9\frac{1}{4}$ inches long. The handles are plain octagon steel, blued.

Price,	-	-	-	-	-	per set of 12, \$5.75.
Price,	-	-	-	-	-	each, .50.

JOHNSON & LUND,

THE

Dental Office and Laboratory.

FOURTH SERIES.

VOL. 2.

PHILADELPHIA, OCTOBER, 1888.

No. 4.

THE DENTAL LABORATORY,

BY THEODORE F. CHUPEIN, D. D. S., PHILADELPHIA, PA.

Continued from Page 59, July, 1888.

A Piece of scantling six by six makes a good block on which to place the anvil; and to prevent the noise and jar of the hammering through the household, a piece of thick rubber—a half inch thick—may be nailed or otherwise secured to the bottom of the wood, next the floor. A jeweller's anvil such as is shown at *Fig. 10*, is an excellent form to have on the block; but as these are expensive, a square 50 pound weight or a square block of iron 5 by 5 inches square will answer the purpose as well. Such a substitute for the anvil may be secured to the block by tacking a rim of sheet iron around the top of the block to hold it in place.



FIG. 10.

The final swedging is concluded with the *best die* and conducted in the manner already indicated.

Before each swedging, the plate should be annealed, and while hot thrown into a jar of *pickel*, (a solution of sulphuric acid and water, one part of acid to three parts of water) which cleans the plate off.

In making a die for an entire upper set; the location of the central air chamber (if the workman purposes to use an air chamber) is filled with a piece of thin base plate wax on the plaster model, and this is cut into shape with the warmed wax spatula and sharp knife blade. A film of sandarac varnish is painted over this wax air chamber and the model, to give it a smooth surface and to retain it in place. A die thus made has the central air-chamber reproduced, and a plate swedged on such a die carries the imprint of the chamber on the plate.

To make this chamber sharp and well defined we have made use of a piece of boxwood, or vulcanized rubber like the handle of a dinner knife, which may be sharpened on one end, and with it, the plate is carried close up to the die at this point by hammering on it, better

than it can be done with the counter die alone. Such an appliance is shown at *Fig. 11*

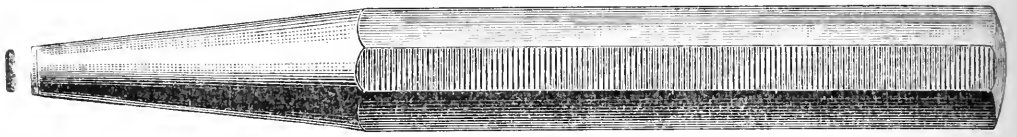


FIG. 11.

When the end gets battered from hammering it may be re-sharpened. This kind of a chamber is called "a blind chamber." The adhesion is not as strong with this style of chamber as with the "Cleveland chamber" which will be described farther on, as it cannot be brought so close to the gum as the other, nor does it present so well a defined edge to that tissue as the Cleveland chamber.

To make a Cleveland chamber the plate is swedged as described, after which the central part is cut out along the edge of the chamber next the gum. There are *Plate cutters*, *Fig. 12*, made for this purpose

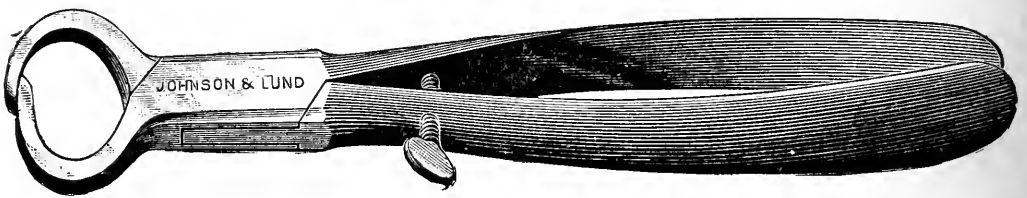


FIG. 12.

but we do not recommend them as a useful tool for the laboratory. We punch a hole at a point in the plate at the circumference of the chamber with the *plate punch*, we next pass through this hole one end of a fine saw secured in the *saw frame* and tighten this up, and then saw out the chamber, putting a little oil on the saw while doing this. In this way the entire piece of plate may be saved and made useful for the rest of the work. The plate being thus cut, it is neatly and smoothly filed around the circumference of the chamber. It is again annealed and re-swedged. The piece of plate that was cut out is annealed and passed through the *rolling mill* and stretched until it is 28 in thickness, of the *plate and wire gauge*. It is again annealed, and passed through the rolling mill in the direction at right angles to the first milling until it is 30 in thickness. In this way it may be stretched or enlarged sufficiently to form the cover for the Cleveland chamber. This piece of plate is now swedged on the die with the rest of the plate in place. It is then traced with a sharp point so as to be even all around the circumference and filed up to the line traced upon it. This cover is then soldered to the plate. We do not however recommend this soldering to be done *immediately*, because, if the plate should *not* adhere, there are no good means of rectifying the mis-fit.

It is better to secure the cover to the plate with adhesive wax and try the plate in, to see if it fits and adheres before soldering it. Should it not fit, a new impression may be taken, new model and die made and the plate *re-swedged*, which could not have been done if the cover had been soldered on, unless by unsoldering the cover from the plate which would be attended with considerable trouble.

Another way, and perhaps a better and neater, of making a Cleveland chamber is to make a die from the model just as it is taken from the impression. When the plate is swedged on this, a pattern of the air chamber is made out of a piece of brass plate of the proper thickness. This is then annealed and hammered on the die with the *horn-hammer* until it fits the place pretty accurately. It is now placed on the plate and soldered to it, with a *minute piece of silver solder*—a piece no larger than a pin's head is sufficient. The plate, with the piece of brass thus united, are now swedged together, the brass readily sinking into the lead counter die. The piece of plate for the cover is swedged over this brass air-chamber. A hole is drilled through the plate near the edge of the brass air-chamber, and the piece sawed out in the manner before described. The cover is soldered to the plate as indicated in the other plan. The cover can be swedged much sharper by this plan than by the other.

For starting a plate on a lower die—either full or partial, *the plate bender*, (Fig. 13), will be found quite servicable. A piece of hard wood

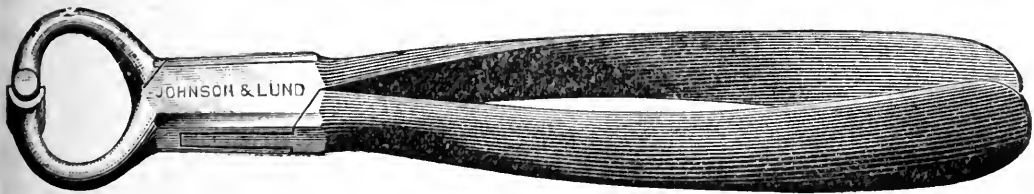


FIG. 13.

whittled at one end like (Fig. 14,) so as to straddle the ridge while hammering it into shape before swedging, is also very useful.

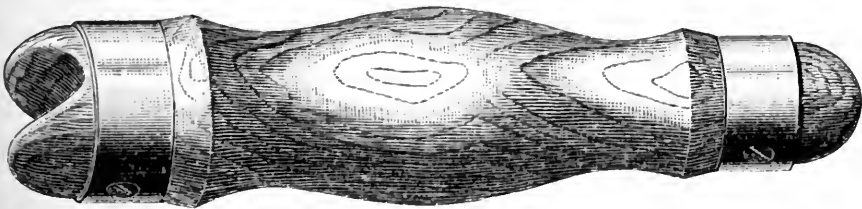


FIG. 14.

In lower partial cases, where only the six or eight front teeth remain, it is customary to let the plate rest on and against the lingual surfaces of these teeth, as also to stiffen the plate by doubling it at this part, by swedging a thinner piece of plate over the first and soldering the two together.

In partial cases where clasps are to be used, it is best always to have not less than *two clasps*. When only one clasp is used, the plate is apt to sway down, and is never so steady, as when two are used. It is better also, when practicable to use *one tooth on each side of the mouth*, rather than two teeth on the same side.

Bicuspsids and molars are always to be preferred to clasp to, rather than cuspids. These latter teeth are badly shaped to clasp to, and when used, the clasp has to be placed so much on the neck of the tooth, to get a grip, that this tissue is soon worn through by the constant rubbing of the clasp; especially where the enamel is thin.

A clasp should be bent around the distal part of the tooth, rather than around the medial, so that it may be out of sight. It is admissible, however to bend a clasp around the medial surface of a molar or bicuspid, and in many cases it will be found to hold better and keep the plate more immovably in position. It is *never admissible* to file two sound teeth apart for the purpose of clasping. It is best always to clasp a tooth as high up on *its bulbous part*, as possible, for in this position the enamel is thicker, and the clasp is less apt to wear away the tooth than if bent lower down near the gum margin. In cases where there is great recession of the gum this is particularly indicated, and in order to unite the clasp to the plate a standard is used to attach the two as shown in FIG. 15, at "A."

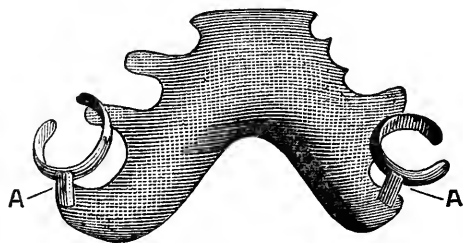


FIG. 15.

When the plaster teeth of the plaster model have been broken off for the purpose of drawing the model out of the moulding sand with more facility, they may be reunited to the model very firmly with a little phosphate of zinc filling material, mixed thin and set aside to harden,

the pins which were used to strengthen them serving as admirable guides in replacing them. Before applying the phosphate of zinc for this purpose the model and plaster teeth should be well dried.

The plate, either partial or entire, being fitted, the bite is now taken.

In partial cases wax is placed over the plate and made to adhere to it by slight warming, particularly in the places where artificial teeth are to be soldered. It is then placed in position in the mouth and the patient directed to close the upper or lower teeth into the wax. If there are any teeth that antagonize in the upper and lower jaw, it is easy to see if the patient has given the proper bite. It is always our custom in making a set of teeth in one jaw, to take an impression of the teeth of the other jaw, and from this impression make a model.

This being done the model will fit exactly into the imprint of the teeth left into the wax on the plate, and the grinding of the artificial teeth be conducted more intelligently, than if a dependence is placed merely on such a guide, as may be given by running plaster into the imprint of the teeth left in the wax, on the plate. The bite being taken, as described, the models are placed in *the articulator* by moistening the models and adding plaster to them so as to unite them to the articulator. Some operators prefer the all plaster articulator to those that are sold for this purpose. The manner of making a plaster articulator will simply be to add new plaster to the model, forming a heel or extension. When this has hardened, small depressions are made into the extension, and the whole is varnished, after which plaster is added to the other model, (which was placed into the imprint left in the wax by the teeth) and filled into the depressions made into the extension.

For taking the bite for an entire upper set, wax is placed on the plate and trimmed to the proper thickness, size or fullness and the patient directed to bite (gently) into the wax. The model which was made from the impression taken of the lower teeth is placed in the imprints of the lower teeth in this wax, and the bite, thus secured, is mounted in the articulator.

This operation, as well as the taking of the bite for entire cases, is more fully described in these papers entitled "Vulcanite Work."

CLASPS.

For making clasps, gold alloyed with platinum is generally used, as it makes the gold tougher, more elastic and more springy than gold of which the plate is made. To make a clasp, the pattern of the tooth to be clasped, is taken with thick tin foil (No. 60) or pattern metal. The metal or foil is carefully pressed around the plaster tooth of the model. It is then scratched in the place it is desired that the clasp should hug the tooth, and then cut to this mark with the very sharp blade of a pen-knife or the abscess lancet. Where the clasp is to be soldered to the plate it should be strongest, and the ends on either side of this point may gradually taper. Clasps are best bent with *round and flat nose pliers*. A pair of flat nose pliers from which the temper has been drawn and then have *one of the noses filed half round* and retempered will be found very useful for bending clasps. *The clasp bender* is also valuable at times, in making a nice fit in certain forms of teeth. Before commencing to bend a clasp the gold should be annealed so as to make it as easy to bend as possible. It is not necessary to fit the clasp to the plaster tooth on its posterior buccal or anterior buccal surfaces, as this may be done in the mouth

or when the work is completed; besides, if this be done, it will often be found very difficult to remove the clasp from the plaster tooth when it is united to the plate with adhesive wax prior to investing and before soldering. There are some positions of the teeth and plate, where this is so difficult that it is not safe to rely on adhesive wax, for fear of its bending or yielding in removing the clasp from the model. In such cases we prefer to use gum shellac to unite the clasp to the plate. Should this break in removing, the fractured parts may be replaced in exact apposition and so held, when a little adhesive wax (which will not melt the shellac) can be dropped on the fracture and held in place until this cools, which will enable the operator to invest the parts in their exact relation. Another means of getting over this difficulty is to complete the bending of the clasp to the tooth *in the mouth*, then place the plate in position on the gums. A *plaster impression* is now taken of the plate and clasp in position. This is removed and plaster and sand run into this impression. The impression plaster is then removed, and the clasp and plate united by soldering. This is a more certain way of procedure.

Where, from the peculiar shape of the tooth, a clasp must be bent to fit with great accuracy, it may be accomplished as follows. An impression of the tooth is taken (either entire or in sections), with plaster and powdered pumice. This is thoroughly dried and a die made *into it*. A counter die is also made. The clasp is bent with pliers as nearly perfect as possible and then annealed. It is then placed in proper position *in the counter die* and swedged to proper shape with the die. FIG. 16 illustrates a die to swedge up a clasp accurately.

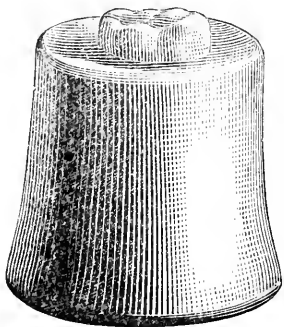


FIG. 16.

A *crib clasp* is sometimes used in the lower jaw to prevent the plate from pressing down and wounding the gum. It consists of a piece or pieces of metal united to the clasp and resting on the masticating surface of the tooth. To make a crib clasp a die and counter die are used and made in the manner above described, if the work is desired to be particularly neatly done; although it may be done without the die and counter die.

SOLDERING.

This operation requires considerable skill and practice. The one rule however consists in heating the work *thoroughly and evenly throughout not in one place only*. The plaster investment, the plate, the teeth and clasps should *all* be heated to such a point that the solder is *nearly* ready to melt, when the flame is pointed (as it is termed) to cause the solder to flow evenly and smoothly by the con-

centration of the heat. In soldering clasps to the plate, it is best to file away the plate at all points except at that point where it is intended to unite it to the clasp. At this point it should be fitted *close*. Indeed close fitting is one of the principal secrets of successful soldering. If it be impracticable to do this, by painting the clasp and plate with thin whiting and water at the parts it is desired that the solder should *not* flow, the same object will be gained; but this must be carefully done *as solder will not flow where there is whiting*. It is a bad plan to let the solder flow all around, and then use a fine saw to separate the plate from the clasp at points where it is not desirable for the two to be united. Formerly soldering was done entirely by *the mouth blow pipe*. The *self acting blow pipe* was at one time much used to heat the work up thoroughly. It consisted of a tight vessel, from which a tube extended, and passed near to the flame of the soldering lamp. The vessel was partly filled with alcohol and this was boiled by means of a small blaze attached to the soldering lamp. The vapor thus generated and expelled through the nozzle exerted a strong blast against any object at which it was directed. But point-

Fig.1

Fig.3

Fig.2

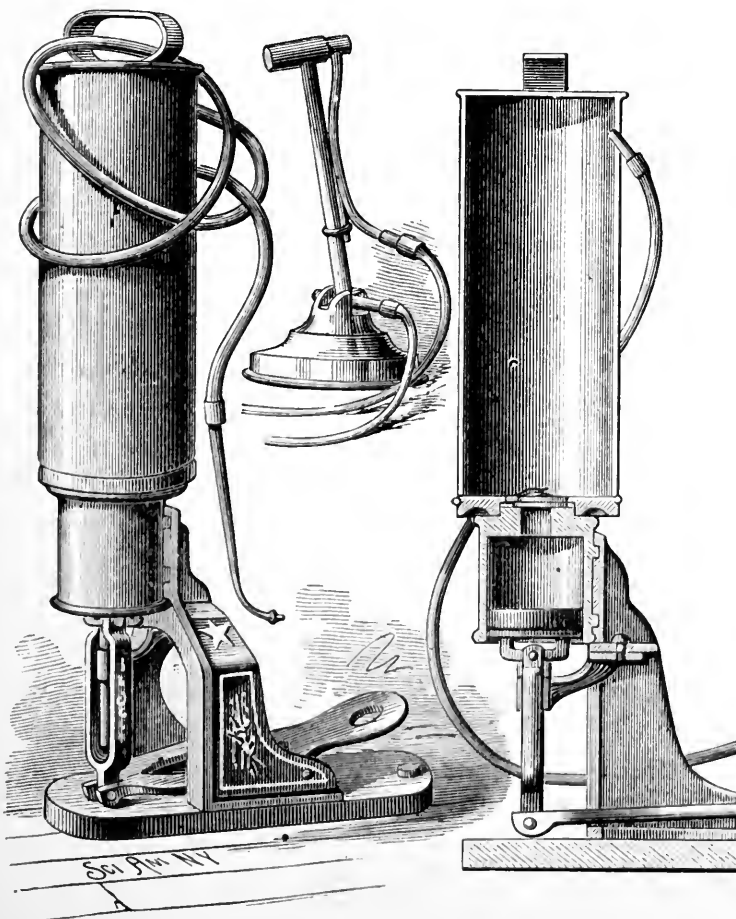


FIG. 17.

ing the blaze was impracticable with this instrument. The Burgess Blow pipe, FIG. 17, is a most excellent device for soldering. With it the blast is under entire control of the operator and the most powerful blast, or the finest pointing of the blaze, may be exerted at will. We prefer however to all other devices for soldering *the gas blow pipe and bellows* designed by Mr. Fletcher of England and shown in the following cuts, FIG. 18.

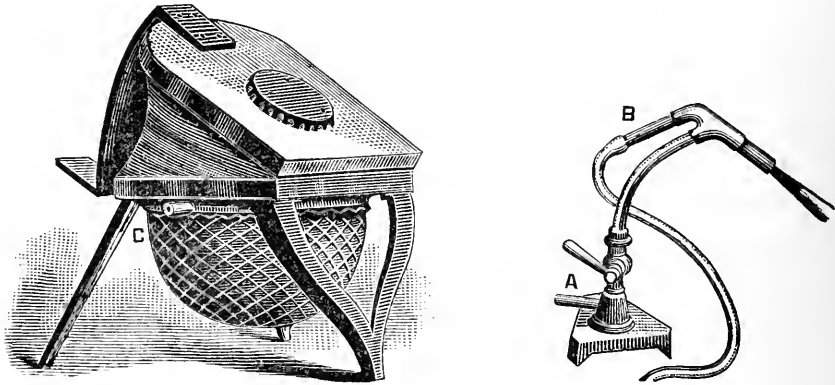


FIG. 18.

This device is used with illuminating gas. The gas is conducted to the blow pipe by means of flexible rubber tubing from any burner to the tube A of the blow pipe, while another tube is placed at B which is used with the mouth for small or light work or the same may be connected with the tube of the bellows at C for large or heavy work. The handle or lever just above the gas supply tube A, controls the flow of gas, and the size of the blaze, so that a large, small or pointed blaze may be at any time directed against the work. With this blow pipe, soldering a full set of teeth may be done with comparatively little fatigue. The work is merely held against the blaze while the blast is increased or diminished by means of the foot exerted on the bellows, or by means of the lever on the blow pipe being opened or closed to admit a larger or smaller supply of gas. The right hand is untrammelled, so that any refractory piece of solder may be pushed into place by means of a suitable instrument for this purpose, mounted in a wooden handle and directed with the right hand. But by the close fitting of the parts, no aid of this kind will be needed, other than the well directed pointing of the blaze.

The soldering pan or furnace, FIG. 19, was at one time extensively used as a means of holding the work while it was being soldered, as well as for heating it up preparatory thereto. It is an excellent device for the purpose although rather cumbersome and unwieldy. A few pieces of ignited charcoal are put into the bottom of the pan and more added until the receptacle is nearly full. The piece of work

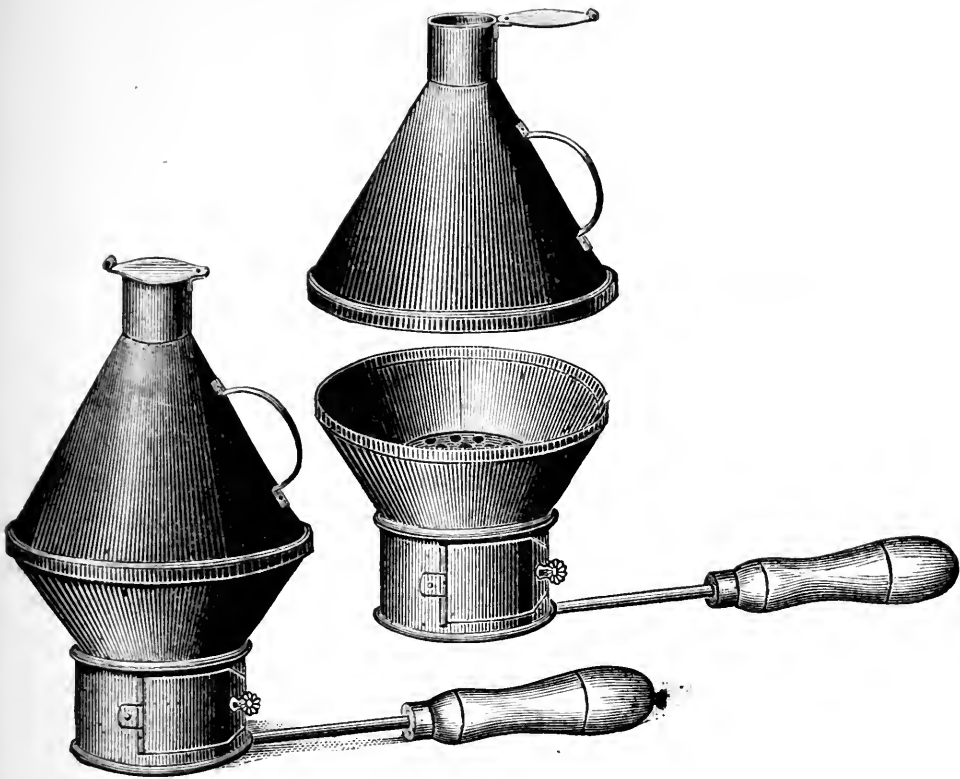


FIG. 19.

invested and ready for soldering is now laid on and more charcoal, in small pieces about the size of "a filbert," are filled in, all around the work, and a large piece is laid over the work, and the cover put on. The little door is opened to admit the draft and the device set one side for all the charcoal to kindle. By the time the coal becomes a glowing mass, the work will be so thoroughly and evenly heated that it will require only a slight blast from the blow pipe to fuse the solder evenly and smoothly all over the work. The disadvantage of the device consists in its size as well as the large body of glowing charcoal which must necessarily be held near the face during the operation. *The carbon or asbestos blocks, FIG. 20, will be found much more handy*

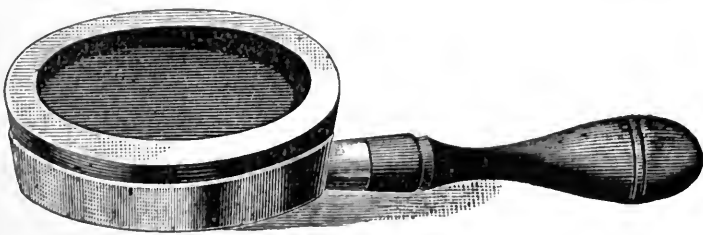


FIG. 20.

than the "Soldering pan furnace, FIG. 19," and is intended for the same purpose. When the work is invested and ready for soldering it is placed over the basket or the spider, on the bunsen burner shown in cut FIG. 21, the gas is ignited and the work is allowed to heat up

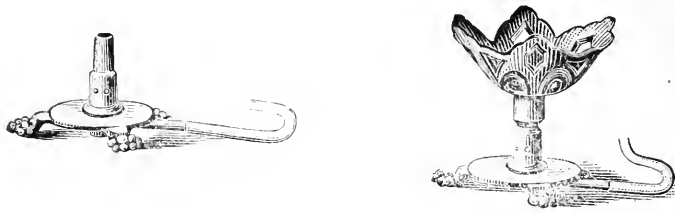


FIG. 21.

thoroughly, when it is removed, with a pair of *long soldering tongs* to the carbon block, and there subjected to the heat of the gas blow pipe necessary to fuse the solder.

On the subject of investment we have a word to say. *Fine sea sand*, *powdered pumice stone*, or *powdered marble dust* are recommended to be mixed with the plaster of investment for the purpose of preventing the investment from cracking when subjected to heat. *Asbestos*, is also recommended for this purpose. But despite the use of these, and the most careful and even heating of the case, the investment will often crack or spread, thereby causing a mis-fit, which is irremediable, after the work is entirely completed. To meet such a misadventure we have for some years used the following device, Fig. 22.



FIG. 22.

A piece of sheet iron similar to what is used for stove pipes, about $1\frac{1}{4}$ inches wide by 5 inches long is nicked with the plate shears as shown in the cut, after which it is bent in a horse-shoe form

with the nicked parts bent under as shown in Fig. 23. When the case is ready for investment, the plaster is mixed with either sand or powdered marble dust as also some fine asbestos cut very short in small pieces.

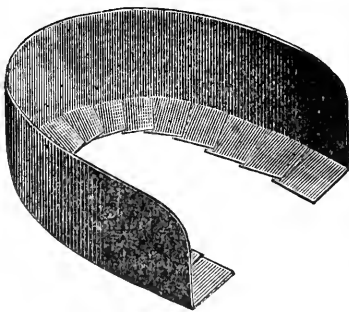


FIG. 23.

We do not, however, favor marble dust as one of the materials for investments as it forms with heat a kind of slag which is very difficult to remove from the work, adhering sometimes very firmly to the mineral teeth. There is a great selection in asbestos the purpose of mixing with plaster for investment purposes. Some is very coarse, with hard pieces almost as rigid as pieces of stick, while other selection of this

material is soft, free from rigid particles and as floccular as sheep's wool. *The latter* is the best for investments, but even in this form it should be cut up with a pair of scissors into small particles so that

it will mix readily with the sand and plaster, and when these have all hardened, admit of being trimmed with a knife in the proper way before soldering. The case, as we have said, being ready for investment, the plaster sand and asbestos in equal proportions are mixed with water. The device, Fig. 23, is now laid on *a glass slab* and some of the investment is plastered all over the inside and over the bottom part of it, where it was nicked. The investing plaster is also filled, in the inner part of the plate and over the labial surfaces of the teeth. The plate is now taken at its back part, near where it adjoins the soft palate, with a pair of solder tweezers, turned over and laid into the plaster previously placed in the device (FIG. 23). The investment should be brought up, well over *all the teeth* and well over the suction chamber, permitting only so much of the plate to be exposed, as is necessary to flow the solder over it, from the backings of the teeth. All sharp angles or deep depressions should be avoided when trimming the investment, otherwise the heat which is exerted from the "pointed flame" will be reflected from the point where it is desirable to have it in its greatest intensity.

*To be continued.**

HUNGER.

AN ARTICLE OF FACTS AND THEORIES THEREON COLATED FROM

SEVERAL SOURCES BY

THEODORE F. CHUPEIN, D. D. S.

Hunger may be said to be one of the great incentives to civilization. Where food is easily obtained, as in countries with genial climates, where Nature is exuberant in her bounty, men who are naturally lazy, will be content to pass their lives in indolence and inactivity, because they are not driven by the pangs of hunger, to the exertion of procuring food, either by their labor or the chase.

In those countries, where the rigor of the climate, or the unfruitfulness of the soil, compels men to work, or go hungry, their necessities become the incentives to invention, in order to provide for their comfort or their wants: and thus, civilization may be said to be dependant, for its advance on hunger.

What is hunger? Nearly all persons, whatever may be their condition, have been aware of the manifestations of hunger, at some period of their lives; yet few—let us hope—may be able to describe the tortures, when hunger culminates into starvation.

Hunger may be defined as the peculiarly pleasurable sensation, in the region of the stomach, produced by the want of food. It is a sharp keen sensation not accompanied by either pain or uneasiness;

but if the stomach is kept unsatisfied for any prolonged period, then the symptoms become decidedly unpleasant and painful. When there is a prospect of satisfying the appetite, hunger is delightful, and as a rule tends to make men cheerful and lively; but the sinking feeling which ensues when food is withheld, and when there is no prospect of its being obtained, the feeling soon changes into one of absolute pain, which being prolonged gives the feeling, which has been described as if the vitals were being torn with red hot pincers. A feeling of exhaustion, feverishness, headache, light-headedness often culminating into madness if food is not obtained. All the holiest instincts of love, friendship or affection of the heart are benumbed, and give way before the insatiable cravings of hunger, and mothers have been known to dispute and wrangle and fight with her starving companions over pieces of their dead infant's flesh.

We may all know what hunger is, but physiologically it remains yet to be described. *Waste* and *repair* are the two functions which go on, in all animals, while life lasts. No movement that we may make, no thought which passes through our brain, no word or sound that is formed by our tongue or is issued from our mouth; but entails the *waste* of tissue, and if there be not food to make fresh blood to compensate for this waste, then death must ensue.

If the blood be examined by the microscope two kinds of disks are revealed to us. Some of these are colored, others without color; and it has been observed that hunger diminishes the number of these discs but increases the quantity of the waste products in the blood.

Hunger seems to tend to cannibalism more at sea than on land, and men at sea suffering the tortures of starvation, whose glaring eyes and wolfish expression tell more plainly than words how they hanker for the flesh and blood of their comrades, have been known to lose all feelings of cannibalism when thrown by shipwreck on land, even though their hunger was not appeased.

The excessive pains of hunger gradually cease after the fourth or fifth day. It is then that the victim becomes lividly pale and emaciated. The cheeks are sunken and all the vitality that is left in the body seems to be centred in the feverish brightness of the eyes, the pupils of which become dilated and fixed in a wild stare, with lids, which never veil the orbs, deeply sunken in their sockets. The skin changes to a dirty yellowish hue, and is flabby and wrinkled. He grows excessively thin and the thinness is not the leanness of a lean man, but manifests itself by unmistakable emaciation. All the movements of his body are slow and difficult, and his weak shaking limbs seem incapable of exertion or voluntary motion. The cheeks fall close to the jaws, the lips lie thin and tremulous over the pale and

bloodless gums. At this stage the poor victim is free from pain, and the mind lapses into a state of sleepless delirium; the hand trembles the voice grows feeble, while the poor creature if asked what he feels, can only answer faintly that he is hungry. These are said to be the principal phenomena of starvation before it culminates in the last throes of death; little information concerning the agonies endured by starving men can be gleaned; as those who have undergone them are seldom spared or are able to recount them.

But although the want of food causes hunger, it does not itself constitute hunger; for food may be absent without the sensation of hunger resulting. Idiots and insane people frequently subject themselves to prolonged fasting without any hungry craving; and persons attacked with certain diseases have laid in their illness many days without food. As a rule animals whose habits of life are slothful, sluggish, inactive or indolent are observed to be capable of the longest fasts, while others whose habits are active cannot sustain any lengthened period of abstinence. Thus the *sloth* has been known to suspend itself from the bough of a tree for *40 days* without food. *Land turtles* have been kept alive for *18 months* and *serpents 5 years* without food. A total privation of food is longest endured without fatal consequences, by animals manifesting the lowest vital energy. In like manner also, there are animals, like the hedgehog, the bat, the dormouse, the marmot, etc., which hibernate and yet live through many months, in a state of lethargy, without food. The emotions of Joy and Grief destroy the cravings of hunger.

Want of food is therefore the primary, but not the proximate cause of hunger.

The length of time that a man may live without food may be varied by circumstances. Ordinarily he will die after the lapse of six or eight days, but the time may be prolonged if the person be quiet and use no exertion whatever. There is a case recorded where 14 persons male and female, who survived death from starvation on being shipwrecked, after a privation of food for *23 days*, but the record does not state if they were deprived of water during this interval. As horrible as it is, experiments have been made on starving persons, to establish data, and a French philosopher has been able to determine, that should a man weigh 100 pounds, when his starvation has reduced him to 60 pounds he will die. The loss of *forty per cent* of substance is therefore known to be the limit of starvation, or the limit to which life may continue.

Goldsmith says that the captain of a wrecked vessel told him: "I was the only person who had not lost my senses when we received accidental relief. My pains at first were so great that I was often

tempted to eat a part of the men who died, and which the rest of the crew actually lived upon. During the continuance of the paroxisms I found the pains insupportable, and was desirous, at one time, of anticipating that death which I thought was inevitable. But my pains gradually ceased after the *sixth day* (for we had water in the ship, which kept us alive) and after this I was in a state rather of languor than desire; nor did I wish much for food, except when I saw others eating. The latter part of the time, when my health was almost destroyed, a thousand strange images rose upon my mind, and everyone of my senses began to bring me wrong information." When he was presented with food by the ship's company that took him up, he could not help looking at it with loathing instead of desire, and it was not till after four days that his stomach was brought to its natural tone, when the violence of his appetite returned with a sort of canine eagerness.

What is the cause of hunger? The popular instinct answers; want of food! Food has been called the fuel of life—though it would be more correct to say that the fuel of life is that whereof food is the raw material—to wit; the tissues of the body themselves. Hunger is the first warning signal given to let us know that the body's store of fuel needs replenishing; and in this sense it may be said that the want of food causes the pains of hunger. But if the want of food causes the hunger pang, it is strange that the administration of substances that are not food will dispel it. For example the eating of lumps of clay—as do some of the South American Indians, or the chewing or smoking of tobacco—quite as effectually as a hearty meal—for a time at least. An explanation of the cause of hunger has been given that when the stomach is empty the acrid gastric juice acts on the coatings of the stomach corroding them, thereby causing pain; but it must be remembered that it is only when food is introduced into the stomach that the gastric juice is poured out to act on and to digest the food, so that this theory does not hold. But it was said by other physiologists that though the gastric juice was not poured out when the stomach was empty, yet it accumulated in the little secreting pits that dot the walls of the stomach. There being no food to call it out of these little pits or follicles, it keeps on accumulating till it swelled them out to an extent that made them pinch the ultimate ramifications of the gastric nerves, thus causing pain. This theory would be very plausible if the gastric pits were covered with water tight lids which were shut when the stomach was empty, but which flew open when it was filled with food; this, however, is not the case. The mouths of the gastric follicles are perfectly open. Whenever gastric juice accumulates in them, there is nothing whatever to prevent it

from running out. Like all fluids it must move in the direction of the least resistance. It would naturally run out at the open orifice of the secreting-pits in which it was formed, than remain in to distend the walls of these pits in a futile attempt to escape at the wrong or closed end of them. Perhaps the oddest belief about the cause of hunger pangs is the one which is to this day the most popular. According to this view, when the stomach is empty its walls fall together and their surfaces, grinding over each other, produce extreme pain. A very simple experiment will suffice to dispose of this theory. If a starving man be taken, and liquid food, say milk, be injected into his veins, he ceases to feel the pains of hunger, Yet nothing has been put *into* his stomach. That cavity is as empty after the experiment as it was before it. Its surfaces must be "grinding over each other" as grimly as ever; yet the pain this process was supposed to cause, has vanished.

No explanation yet given is satisfactory. Swallowing other things than food will dispel the pain of hunger. That pain may also be made to disappear without swallowing anything at all. The local application of certain substances to the stomach will also prevent the pain of hunger. It cannot be due to the derangement of the nervous system, as hunger even when it develops into starvation, has hardly any marked effect on the nerve-tissues as can be shown. Besides if the pneumo-gastric nerves, which supply the stomach, be cut, that is if the nervous system of the stomach be practically eliminated from the field altogether, it is found that the sensation of hunger continues just as if nothing had happened.

The only reasonable theory that points to the cause of hunger pains seems to be in the lack of the circulation of the blood through that organ. Whatever hurries the circulation of the blood in a fasting stomach, is noticed, to relieve the pain of hunger. The direct application of a bolus to the stomach, acting as a mechanical stimulant, may have this effect. And even such things as the injection of fluid food in the veins may correct the general alterations which we have seen, fasting produces in the blood, and which carrying a feeble and depreciated supply of nutrient fluid to the tissues of the stomach, produces in it that specific modification which manifests itself in the local sensations of hunger.

THE PRACTICAL PLACE.

FILING GLASS.

The *Pharmaceutische Centralhalle* states that by dipping the file into a strong soda lye and then, still wet, into coarse sand, it is possible to file glass even very carelessly without danger of breaking it.

Water as a Constituent of Organic Substances.

Water, says Dr. Whitelaw, forms three-fourths of the weight of living animals and plants, and covers about three-fourths of the earth's surface. Professor Chaussier dried the body of a man in an oven, like a brick in a kiln, and after desiccation the body weighed only twelve pounds. Rather more than a pound of water is exhaled daily by the breath, about $1\frac{3}{4}$ pounds by the skin, and $2\frac{3}{4}$ pounds by the kidneys, making the daily emission of water by the body about $5\frac{1}{2}$ pounds or not quite 3 quarts. The following is the percentage of water in some well known articles :

Wheat	15	Mangel wurzel.....	85
Barley	15	Cabbage (leaves)	92
Oats	16	Cabbage (stem)	84
Rye	12	Mushroom.....	96
Rice	13	Fungi.....	86 to 95
Beans (field).....	15	Potato	75
Beans (kidney)	23	Watermelon.....	94
Peas.....	14	Cucumber.....	96
Turnips.....	88	Vinegar plant.....	95
Carrots	83	Wheat flour.....	13 to 16
Rye flour.....	14	Cocoa	5
Barley flour.....	14	Manna.....	10
Maize flour.....	13	Figs	21
Indian corn flour	14	Plums	75
Oatmeal.....	14	Apples.....	80
Wheat bread.....	44 to 48	Gooseberries.....	80
Rye bread	44 to 49	Peaches	75
Cane sugar	5	Egg, entire.....	74
Linseed cake.....	10	Milk	87
Flesh.....	77	Blood	79 to 83
Skin	58	Gastric juice.....	97
Bones, variable.....	7 to 20	Trout.....	80
Beef.....	74	Pigeon... ..	79
Veal.....	75	Cheese.....	40
Mutton	71	Hair, wool, horn.....	9 to 11
Haddock.....	82	Brandy	56
Sole.....	79	Whisky	47
Tea.....	5	Rum	30
Coffee.....	12	Beer.....	90

Scientific American.

NICKEL PLATING.

The following solution for electro-plating with nickel is used by several firms in Hainault ; 500 grms. of nickel sulphate, 365 grms. of neutral ammonium tartrate, 2.5 grms. of tannin dissolved in ether, and 10 liters of water. One and one half liters of water are first added,

and then boiled for 15 minutes, the remainder of the water is then added and the whole filtered. The *Electrician* says: "Solution yields an even white deposit, which is not brittle, and the cost of which is hardly more than that of electro-plating with copper."

Nickel plating is now effected at several works in Belgium with the following bath: Sulphate of nickel, 1 kilog.=2.2 lb.; tartrate of ammonia, 0.725 kilog.; tannic acid with ether, 0.005 kilog.; water, 20 liters=4.4 gallons. With this formula a thick coat is deposited on all metals in a short space of time and by a weak current.

In a gallon of sea water there are 1890 grains of salt, besides some magnesia, iodine, and bromine.

Scientific American.

PATENT RIGHTS AND THE DENTAL PROFESSION.

The question, "Is dentistry a profession?" is no longer argued even by intelligent people outside of the profession. It is admitted everywhere. Frequently, however, we see very quaint and curious ideas of what dentists as professional men should do and what they should not do in order to maintain their professional standing. The most unique idea of all is that appliances invented by the ingenuity of the dentist must not be patented, and if he does secure such patents, he must at once be dropped from the professional ranks. Now, the fact is, the action of patenting any appliance or method has nothing at all to do with the professional standing of any dentist; it is not *per se* an unprofessional act. If any man freely and fully grants to his profession, without restriction, the use of any method he has discovered, let all praise be his; but because his neighbor cannot afford to do this, or does not do it, let no man be so weak and unjust as to say that he has acted unprofessionally. Indeed, he may be, and no doubt often is, in every-day life and practice the better professional man of the two.

A man's professional standing, we are happy to know, is determined by his intelligent, competent procedure in professional ways and by the noble and gentlemanly character which gives direction to every phase of his life's work, and very little by the fact that he has or has not taken out a patent upon any of his inventions.

In the name of all that is logical, we wish candidly to ask all reasonable persons if a dentist has not as good a right to receive payment for an invention over which he has spent time, thought and money as he has to receive payment for any of the usual operations in dental practice. His invention represents time, outlay, and brain power, just as much as does the gold filling which he inserts, and why should he not receive the compensation which a patent secures?

Our authors, our literary men, secure copyrights upon their books and manuscripts, and yet no one is so dull and illogical as to accuse them of unprofessional conduct. Certainly not : they deserve protection. Now the patent right to the inventor is just the same as the copyright to the author, and they both have a perfect and legitimate right to secure the benefits coming with such protection without being called to account for being "unprofessional" by writers who cannot be said to have grasped the true meaning of the term.

Patent rights, as well as copyrights, are productive of much injustice and subject to many abuses, but no reasonable man will argue from this fact that there is anything belittling or unprofessional in securing a patent right or a copyright. We honor the man who gives his inventions to his profession without price as highly as do any of our contemporaries, but we strongly deny that a dentist who secures a patent can—on that account—be called unprofessional.

Western Dental Journal.

The physicians are vigorously discussing the ethics of patenting instruments invented by members of the profession, in the *Medical Journal*. They never hesitate about copyrighting a book, though, the *Sanitary News* has discovered.

LOCAL ANÆSTHESIA BY ETHER.

Hénoque and Frédet, in a communication to the Société de Biologie, recommended the application of ether in the form of spray in the neighborhood of the external auditory meatus, as a means of rendering tooth extraction painless. The ether acts on the branches of the trigeminal in the face, thus producing sufficient anæsthesia.

CLEANSING THE HANDS.

Dr. Vogel, of Eisleben, says that he has noticed that coppersmiths, tinsmiths, etc., whose hands become covered with dirt from working in oxides and acids which cannot be removed by ordinary means, first rub their hands with warm oil and then, when this has thoroughly penetrated, with powdered borax. Subsequent washing with soap and water makes the hands perfectly clean. He advises those who have to use carbolic acid to go through the process above described first, and claims that in this way (1) disinfection is more thorough; (2) the hands are made purer than it is possible to make them by soap alone; (3) the hands remain soft and free from rough epidermic scales, and the odor of carbolic acid is destroyed; (4) the uncomfortable anæsthesia of the hands after washing with carbolic acid is avoided.

WHAT A TON OF COAL YIELDS.

A ton of coal yields about 8,000 cubic feet of gas and 1,500 pounds of coke. The purification of the gas furnishes 45 gallons of ammonia water, from which is obtained sulphate of ammonia for agricultural purposes, and about 130 pounds of tar. It is here that the operation becomes especially interesting, for from this last named product are obtained 70 pounds of pitch, 18 of creosote, 9 of naphtha, 13 of heavy oils, 6 of naphthaline, 4 of naphthol, 2 of alizarine, about 1 each of phenol, aurine and aniline (the substance to which we are indebted for so wonderful colors), 10 ounces of toluidine, 6 of anthracene, and 12 of toluene. Finally, it will interest photographers to know that hydroquinon, that product that has been so much spoken of recently, and which was at first obtained from cinchona, is now obtained from coal by industrial processes.—*La Science en Famille*.

WATER AS A LOCAL ANÆSTHETIC.

Professor Liebreich, in a paper on local anæsthetics, read before a recent German medical congress, describes experiments made by him with a number of substances as regarded their anæsthetic properties when subcutaneously injected. He found that among inorganic compounds distilled water, ammonium chloride, and ferric chloride possessed eminent anæsthetic influence. It was noteworthy that the influence of the first of these lasted about three-quarters of an hour. The bromides of potassium and ammonium were without effect. In the organo-inorganic group, hydrochinone and sodium ethylsulphate were specially active, and among purely organic compounds the most powerful was antipyrin, then the essential oils, the oils of turpentine, and of chamomile being specially active.

SOMETHING FOR MOTHERS.

FROM BABYHOOD.—The variation in the period of incubation may be due to the nature of the epidemic or to susceptibility of the patient. In most cases the sooner the disease is developed after exposure the severer will be the type of the attack :

Scarlet fever, 12 hours to 7 days.

Measles, 9 to 12 days.

Small-pox 12 to 14 days.

Chicken-pox, 8 to 17 days.

Diphtheria, 2 to 8 days.

Whooping-cough, 4 to 14 days.

Mumps, 8 to 22 days.

If a child passes the longest time here stated, it will, with very few exceptions, escape the disease.

Dental Luminary.

THE USE OF STIMULANTS BETWEEN MEALS.

George Harley, M. D., in Popular Science Monthly.

Although all persons who indulge in alcoholic stimulants well within the margin of actual drunkenness speak of themselves as "moderate drinkers," there are two special classes of them which bear no resemblance to each other, except in the one solitary circumstance that they never at any time take sufficient to intoxicate themselves. The one class is that which only partakes of stimulants while eating; the other indulges in them between meal times. To the latter habit is applied in this country the title of "nipping," while in the East it is spoken of as "pegging." And this is the most pernicious of all forms of drinking, from the fact that stimulants taken without at the same time partaking of food, though only imbibed in small quantities at a time, have most deleterious effects on the internal organs. A man who habitually indulges in one glass of sherry in the forenoon, a brandy-and-soda in the afternoon and a glass of whisky-and-water in the course of the evening does far more injury to his constitution than one who partakes of a larger quantity of alcoholic stimulants at meal times.

A NEW LOCAL ANÆSTHETIC.

According to the *Wiener Medicinischen Blaetter*, Dr. Lewin describes a new local anæsthetic of surprising power and rapidity, viz.: Hayah or erythroflein. Its intensity says the doctor is *iberraschend*, and it is destined not merely to supplant but to quite overthrow and destroy the reputation of cocaine. It is of African origin, and is found in the shape of a red mass called *hayah*. A minute portion placed upon the tongue renders the organ utterly devoid of the sense of taste or even of sensation. Chemically it is a glucoside. A drop or two of an aqueous solution placed in the eye of a cat renders the organ absolutely insensible in fifteen or twenty minutes, and it is more or less anæstized from ten to twenty-four hours afterwards. Inwardly or subcutaneously injected, it renders frogs and such animals inert, the frequency of heart-beat is lessened from thirty-eight down to eight beats per minute, and a spasm or cramp, beginning at the eyes, passes over the entire body every few moments, extending to the very end of the tail. In animals that vomit, this reflex occurs within a few moments after injection. The source of this wonderful medicament is said to be a plant described by Oertel in the early part of this century under the name of *Erythroleum judiciale*, the substance being used in the native African trials by ordeal. In these trials the bark of the plant is powdered and mixed with water, and given to the accused to drink. If vomiting follow immediately, the

accused is held to be guiltless; but if he fail to vomit, the contrary was held, and he was immediately stoned or clubbed to death. The Berlin Museum possesses the material originally sent to it by Oertal, and recent experiments with it develop the fact that the material now sent from Africa under the name of "Hayah" is an extract of the same, and the active principle obtained from both is identical. We await further developments with great interest.

MYRRH AS A PROPHYLACTIC AGAINST INFECTIOUS DISEASES.

Fempe (*Bolletino Farm.*) recommends the placing in the mouth of a fragment of myrrh if one finds oneself in an infected atmosphere, and he has employed this means as a prophylactic in several epidemics. He considers myrrh to be a specific against contagion. Physicians in the East, it is said, use it as such constantly in visiting patients.

THE LUXURY OF A ROSE JAR.

A delightful perfume for halls and parlors in dwelling houses or hotels can be easily procured at this season of the year, and it is such a pure yet delicious odor that it charms every one. It is simply a rose jar, which should be opened for about one hour every morning and then carefully closed. A writer in one of our English contemporaries describes the best method for stocking the jar, and in doing it suggests the preparation of the rose stock should be detailed to the care-taking member of the family, who never forgets anything. Gather the rose petals in the morning; let them stand in a cool place, toss them up lightly for one hour to dry; then put them in layers, with salt sprinkled over each layer, in a large covered dish—a glass butter dish is a convenient receptacle. You can add to this for several mornings till you have enough stock—from one pint to a quart according to the size of the jar; stir every morning and let the whole stand for ten days. Then transfer it to a glass fruit jar, in the bottom of which you have placed two ounces of allspice, coarsely ground, and as much stick cinnamon, broken coarsely. This may now stand for six weeks closely covered, when it is ready for the permanent jar, which may be as pretty as your ingenuity can devise or your means purchase. Those with double covers are the best, and very pretty ones in the blue and white Japanese ware, holding over a quart, can be bought for a few shillings.

Have ready one ounce each of cloves, allspice, cinnamon, and mace, all ground (not fine); one ounce orris root, bruised and shredded; two ounces of lavender flowers, and a small quantity of any other sweet scented dried flowers or herbs. Mix together, and put into the jar in

alternate layers with the rose stock, and a few drops of oil of rose, geranium or violet, and pour over the whole one-quarter pint of good cologne. This will last for years though from time to time you may add a little lavender or orange flower water, or any nice perfume, and some seasons a few fresh rose petals. You will derive a satisfaction from the labor only to be estimated by the happy owners of similar jars.

Scientific American.

"ALMADINA," A NEW GUM.

Under the various names of "almadina" "potato gum," "euphorbia gum," or, more shortly, "E. G.," a peculiar resin of African origin has been of late years gradually finding its way to the European drug markets in steadily increasing quantities. Hitherto its chief if not its only use in the arts has been as a "substitute" for or addition to India rubber, and we learn it is not only much cheaper than caoutchouc, but actually improves the latter when added to it in certain proportions. Among the advantages over pure caoutchouc which mixtures thereof with "E. G." are said to possess, not the least are diminished porosity and greater durability.

Scientific American.

SILVER PLATING SOLUTIONS.

Dissolve in a pint of distilled water 50 grains of silver nitrate and $8\frac{1}{2}$ oz. av. of potassium iodide. Employ a current of moderate strength. When a sufficiently thick deposit has been obtained, wash the object with a solution of potassium iodide in water (1.4), then with pure water, and burnish.

Scientific American.

THE DISTRIBUTION OF PHTHISIS.

The third volume of Hirsch's great work, "A Hand-book of Geographical and Historical Pathology," recently issued by the New Sydenham Society, contains among much valuable information some striking, and to many, no doubt, novel facts regarding the incidence of pulmonary phthisis. The influence of geographical position upon phthisis turns out to be much less than current opinion would indicate. We are prone to regard it as essentially a malady of temperate latitudes, and of the Anglo-Saxon race, but more accurate statistical information proves that it is virulent in many warm countries, and that some of the inferior races, such as the negroes, the inhabitants of the West India Islands, and the people of the South Sea, suffer more in proportion than the nations of Europe. It will be a great surprise to many people to learn that the death-rate from phthisis is as high in sunny Italy as in fuggy England. Those who hold the old-fashioned

notion that damp and cold are the main causes of phthisis will be puzzled to account for the almost complete immunity enjoyed by the inhabitantants of the Hebrides and the Faroe Islands.

Professor Hirsch's conclusions may be thus briefly summed up. Phthisis is everywhere prevalent, but it is rare in polar regions, and rarer still in high latitudes. The main factor in its production is over-crowding and bad hygiene. Heat and cold *per se* have no influence. Damp, when conjoined with frequent oscillations of temperature, predisposes to the disease; but humidity of the air is less important than dampness of soil. Occupation is extremely important, but mainly indirectly, as tending to good or bad hygienic conditions.

British Medical Journal.

BE INVENTIVE.

There are few expressions we hear more frequently than that feeble wail of the cowardly or lazy mind, "I can't!" Every day we see people who permit their progress to be stopped by trifles which, instead of retarding them, should spur every faculty up to the resistive, conquering point. "I can't and "I forgot" are two fatal phrases which should be scratched from the vocabulary of every young man or woman who is ambitious of being or doing anything in this world that shall deserve to be recorded.

Be inventive. Cultivate the creative side of your brain. Don't be stumped. When you seem to be cornered is the very moment to stir yourself and devise some way of making things work.

The Chicago *Herald*, a little while ago, printed some remarks of a drummer descriptive of a certain Yankee's ingenuity, which are pertinent to our present time:

"Talking about ingenuity," said the drummer, "I want to tell you what I saw last winter out West. I was on a train that was snowed in for three days. The company sent us food, but they didn't send any cigars, and the train boy's stock was exhausted the first day. In the express car we found and confiscated a box of smoking tobacco, but there wasn't a pipe on the train. Among the passengers was a Connecticut Yankee who was just dying for a smoke. He got out in the snow and looked around for a weed, or something of that sort, which he might use in making a pipe, but couldn't find a thing. 'I'm going to have a pipe, anyhow,' he said. So he took a lead pencil, opened the wood, took out the lead, and, placing the two strips together again, wound them tightly with the tin foil which came off the packages of smoking tobacco, making them air-tight. Then he took an apple, hollowed a bowl out of it, stuck his lead pencil stem into it, and had one of the nicest pipes you

ever saw. If you don't believe it, make one for yourself some time and try."

This was a common trick in the army, when we could get neither reeds or corn cobs, and sweet pipes they made in every sense. When apples were unobtainable, which was not seldom, we fell back upon potatoes.

Amer. Art Printer.

A POPULAR FALLACY EXPLAINED.

It appears that there is a popular belief in England that the smoke of burning henbane seed draws a worm from an aching tooth, and thereby relieves it. A young domestic who suffered severely from toothache, got some henbane seeds, which she placed over a hot cinder, allowing the fumes to get into the mouth. Soon afterwards she had six or eight "worms" drop "out of her teeth" into a tumbler of water she had ready for the purpose. Her mistress was shown them and they were handed to the medical attendant of the family, who sent a mounted specimen to Mr. Hogg, the eminent microscopist. That gentleman reported in the *Medical Press* that he found the "worm" to be a veritable embryo of a parasitic entozoa, belonging to the trematoda or fluke family, a class of animals known to infest mankind as well as the lower animals. The puzzle as to how the embryos of the fluke found their way into the patient's decayed tooth he solved by saying that in all likelihood the ova of the fluke might have been conveyed into the mouth and stomach by eating tainted animal food—the liver of a sheep suffering from fluke. The eggs may be taken in polluted drinking water—more frequently, however in diseased meat, fish or fowl, which during the masticating process is left behind and safely lodged in a hollow tooth or an exposed portion of the alveolar process there to be retained until more fully developed into the wriggling embryos which were finally dislodged by the henbane fumigation. This apparent justification of the notion that there are "worms" in the teeth was tested in a very practical manner by Mr. G. A. Grierson who relates his experience in a letter to the *London Chemist and Druggist* which is here copied: "Most pharmacists have at some time or another sold 'a penn'orth of henbane seed' for the cure of toothache; many must know the method of effecting the cure, but few there are who believe in the wonderful properties ascribed to *Hyoscyami semina*. Their scepticism is mostly a result of their scientific training, not of any *a posteriori* chain of reasoning. Hence it is, perhaps, that so little has been done in the direction of bottoming this fallacy. When in Lincolnshire during the autumn of last year, I was much impressed by the faith shown in henbane seed as a charmer of the toothache grub by people of sense and ability. One described to me how he

was once a skeptic, but resolved to try the experiment for himself, and having tried it found the grubs floating in water; thinking that even this might be an ocular delusion, he strained the water through a white cloth, and there on the cloth were unmistakably the much-maligned organisms, with a distinct white body and black head. This concrete example there was no resisting; the only thing to do now was to try the experiment and examine the animals. The following I was told was the correct method of procedure: Place the seeds on some hot cinders on a shovel, and when they begin to crackle, invert a bowl over the burning mass; as soon as combustion is over, remove the bowl, fill with hot water and hold over it the open mouth so that the rising steam may enter freely. In about ten minutes examine the water in the bowl for grubs. This method I was told, has been adopted with great pecuniary success by an old woman in the district to whom people came for miles round. She always allayed their skepticism—If, indeed, they had any—by showing the offending organisms to the patient, who could not conscientiously feel any pangs after having seen them. I performed the experiment observing all the necessary injunctions for its success and found the grubs! There they were; there could be no mistake this time—little white worms with black heads. My believing friends were delighted, and a priori reasoning seemed doomed to destruction by the inductive methods of a Lincolnshire quack. But the skeptic element refused to be so overridden, and I inquired if there was a microscope about the place. Fortunately there was—a cheap instrument, but, under the circumstances, quite a godsend, and I set to work with a heavy heart. Soon a cellular structure was made out and, on squeezing, a mass of granules, but no organization that would suggest the presence of an animal. The black head was opaque and structureless; no motion could be detected in any part of the organism. Somewhat puzzled, I repeated the experiment, but this time left out the most important element—in fact, did not bring my mouth over the bowl. The grubs were there as before. Evidently then they were not furnished by the teeth. A more careful examination of them was then made, and they turned out to be nothing more nor less than the embryos of *hyoscyamus*, which had been projected from the heated albumen of the seeds owing to its expanding at a greater rate than the testa, and had lodged in the upper reaches of the bowl only to be dislodged by the water poured into it. The black heads were simply the charred ends of the embryos. I was much surprised, not to say amused, to find that so eminent an authority as Mr. Jabez Hogg had gone out of his way to try and show that the “grubb of toothache” was the embryo of an entozoon and to account for its presence by charging the host with

eating tainted meat. Either the mounted slide he had sent to him was not the genuine article, or he has fallen into a most serious error.

In any case if he performs a "blank experiment" he will find no need to call in the help of the trematoda to account for the appearance of this remarkable "worm" under the circumstances noted."

CONTAGIOUS DISEASES.

Scarlet fever, a contagious disease producing a large annual mortality, is produced by a specific poison which emanates from the person of the patient, and can be caused by no other means, and this poison is remarkable for the tenacity with which it affixes itself to objects, if portable, may convey it long distances, and for its tenacity of life, which renders it difficult to destroy. Diphtheria, also a contagious disease, and largely fatal, may also arise from other causes than contagion, notably from fermenting filth, and requires not only isolation, but cleanliness for its extinction. Typhoid fever and Asiatic cholera, while not directly communicable from person to person, are spread by the dejecta of their victims, which contaminate the water supply, and thus an efficient disinfection of these dejecta is a very desirable thing to accomplish. Small pox may be exterminated by vaccination, and this, I am happy to concede, is a fact on which the public requires less information than most others, albeit these are skeptics here. It is evident if the public knew how diseases arise and are disseminated, it would be prepared to more heartily and effectually second the endeavor of sanitarians to limit and subdue them. In proportion to its knowledge of sanitation would its zeal increase.

G. A. COLLAMORE, M. D.,

Scientific American

THE USES OF GLYCERINE.

To the Editor of the Scientific American:

Few people realize the importance of the uses of pure commercial glycerine, and how it can be used and made available for purposes where no substitute is found that will take its place; and herein, Mr. Editor, if you will allow me space in your well-read journal to speak of its utility, no doubt many of your readers will find an opportunity to thank you. As a dressing for ladies' shoes nothing equals it, making the leather soft and pliable without soiling the garments in contact. Where the feet sweat, burnt alum and glycerine—one of former to two of the latter—rubbed on the feet at night and a light or open sock worn, the feet washed in the morning with tepid water, will keep them during the day free from odor, so disagreeable to those persons who are sufferers.

For bunions and corns *Cannabis indicus* and glycerine, equal parts, painted on the bunion or corn and bound around with Canton flannel adding a few drops of the liquid to the flannel where it comes in contact with the affected parts, will soon restore to health.

As a face lotion, oatmeal made in a paste with glycerine 2 parts, water 1 part, and applied to the face at night, with a mask worn over, will give in a short time, if faithfully pursued, a youthful appearance to the skin.

As a dressing in the bath, 2 quarts of water with 2 ounces of glycerine, scented with rose, which will impart a final freshness and delicacy to the skin.

In severe paroxysms in coughing, either in coughs, colds or consumptives, one or two tablespoonfuls of pure glycerine in pure rye whisky or hot rich cream will afford almost immediate relief; and to the consumptive a panacea is found by daily use of glycerine internally, with the proportion of 1 part of powdered willow charcoal and 2 parts of pure glycerine.

For diseased and inflamed gums, 2 parts of golden seal, 1 part of powdered burnt alum, and 2 parts of glycerine made in a paste and rubbed on the gums and around the teeth at night, strengthens and restores the gums to health, provided no tartar is present to cause the disease, which must be removed first before applying.

And finally, Mr. Editor, to the epicure who relishes a nice breakfast dish of fried fish, he will find "a feast for the gods" by frying the fish in glycerine to a brown, adding a small sprig of parsley when nearly done.

J. S. CHARLES. D. D. S.

Omaha, Neb.

THE USES OF EGGS.—Far more than fish—for it is a watery diet—eggs are the scholar's fare. They contain phosphorous, which is brain food, and sulphur, which performs a variety of functions in the economy * * * * Eggs are, however, not only food,—they are medicine also. The white is the most efficacious of remedies for burns, and the oil extracted from the yolk is regarded by the Russians as an almost miraculous salve for cuts, bruises and scratches. A raw egg, if swallowed in time, will effectually detach a fish bone fastened in the throat, and the whites of eggs will render the deadly corrosive sublimate as harmless as a dose of calomel. They strengthen the consumptive, invigorate the feeble, and render the most susceptible all but proof against jaundice in its most malignant phase. The merits of eggs do not even end here. In France only the wine clarifiers use more than 80,000,000 a year and Alsatians consume 38,000,000 in calico printing and for dressing the leather that is used in making the finest French

kid gloves. Even egg shells are valuable, for allopath and homœopath alike agree in regarding them as the purest of the carbonate of lime.

Eastern Farmer.

FÆCAL IMPACTION.—Ordinary brewer's yeast is highly recommended in fæcal impaction. It is injected into the rectum. It permeates and softens very fast, and makes rectal relief a simple and easy matter.

Southern California Practitioner.

HOW TO EAT WISELY.

As a universal rule in health, and with very rare exceptions in disease, that is best to be eaten which the appetite craves or the taste relishes. Persons rarely err in the quality of the food eaten ; nature's instincts are the wisest regulators in this respect. The great sources of mischief from eating are three—quantity, frequency, rapidity, and from these come the horrible dyspepsias which make a human life a burden, a torture, a living death. By eating fast the stomach, like a bottle, being filled through a funnel, is full and overflowing before we know it. But the most important reason is, the food is swallowed before time has been allowed to divide it in sufficient small pieces with the teeth ; for like ice in a tumbler of water, the smaller the bits are the sooner they are dissolved. It has been seen with the naked eye that if solid food is cut in pieces small as half a pea, it digest almost as soon, without being chewed at all, as if it had been well masticated. The best plan, therefore, is for all persons to thus comminute their food ; for, even if it is well chewed, the comminution is no injury while it is of very great importance, in case of hurry forgetfulness or bad teeth. Cheerful conversation prevents rapid eating. It requires about five hours for a common meal to dissolve and pass out of the stomach, during which time this organ is incessantly at work, when it must have repose, as any other muscle or set of muscles, after such a length of effort. Hence persons should not eat within less than a five hours' interval. The heart itself is at rest more than one third of its time. The brain perishes without repose. Never force food on the stomach. All are tired when night comes. Every muscle of the body is weary and looks to the bed ; but just as we lie down to rest every other part of the body, if we by a hearty meal give the stomach five hours' work, which in its weak state requires a much longer time to perform than at an earlier hour of the day, it is like imposing upon a servant a full day's labor just at the close of a hard day's work.

Hence the unwisdom of eating heartily late in the day or in the evening ; and no wonder it has cost many a man his life. Always

breakfast before labor or exercise. No laborers or active persons should eat an hour latter than sundown, and then it should not be over half the midday meal. Persons of sedentary habits or who are at all ailing should take absolutely nothing for supper beyond a single piece of cold stale bread and butter, or a ship biscuit, with a single cup of warm drink. Such a supper will always give better sleep and prepare for a heartier breakfast with the advantage of having the exercise of the whole day to grind it up and extract its nutriment. Never eat without an inclination.

Hall's Journal of Health.

A NEW DISINFECTANT.

E. Laplace (*Pharm. Zeitung*) recommends crude sulpho-carbolic acid as a reliable bactericide and as a general disinfectant, inferior only to solutions of bichloride of mercury of the same strength, but having the advantage of being much less poisonous and considerably cheaper. It is obtained by mixing equal parts by weight of crude sulphuric acid and crude 25 per cent, carbolic acid heating for a short time, and allowing to cool. This mixture is easily soluble in water. A 4 per cent. solution killed anthrax bacilli within 48 hours, which a 2 per cent. solution of pure carbolic acid was not able to do.

"WANTED—A FIRST CLASS MECHANICAL DENTIST. NO STUDENT OR OPERATOR NEED APPLY."

BY FRANK B. DARBY, D. D. S.

The above notice appeared in one of our journals not long since, and was responded to by twenty-three applicants, each claiming to be what the advertisement called for.

Six out of the twenty-three letters were well written and business-like communications; two addressed the advertiser as Mr., and signed themselves Doctor; five were so poorly written and spelled that they were consigned to the waste basket without answers. Still they earnestly solicited the "job," knowing they could "fill the bill." Two others were frank enough to acknowledge they knew all about laboratory work, "all kinds of metal work excepted." The remainder were of a school-boy composition kind, which suggested commendable labor and perseverance.

The time served by the several applicants ranged from three months to thirty years. One who had served a studentship of a few months, claimed to have extraordinary facilities and wonderful perception, and had acquired the "whole thing" in that short time, but upon investi-

gation had only mastered (in his own mind) red rubber. So one by one they dropped out of line as they were confronted with metal work, until but three remained.

This experience caused the writer to stop and inquire: what are we going to do?

The time has arrived when there is a growing demand for good laboratory men. Every dentist in full practice knows the importance of a first-class mechanical assistant and knows also the difficulty in obtaining one. Taking a student for a term of two or three years means nothing, for as soon as he has acquired sufficient skill to render his service of value he is off to college, and soon into practice for himself.

The demand for skilled workmen has received a new impetus since the development in crown and bridge work, and as its possibilities are undoubtedly beyond our anticipations, we know not to what extent this demand may be carried; and as there is no limit to the inventive skill of our profession, the busy operator must have some one at hand to work out and perfect his brain labor. The question of simply skilled mechanical labor in dentistry has been overlooked; in fact, the doors of the profession have been practically closed to those who might choose to adopt that branch as a life work. Encouragement has been given only to those who possess sufficient time, ability and means to perfect themselves for general practice, and those who have earned a diploma will rarely be found serving in the capacity of assistant.

It seems to me there is a place in dentistry for the mechanic; perhaps not in the broadest sense of the term, and surely not for the "rough and ready" man who knows nothing but work; but for the young man with a common school education, who by force of circumstances or choice must learn a trade, and whose tastes are for light skilled labor, dental mechanics offers an inviting field. The steady, muscular individual, would undoubtedly make a better blacksmith or carpenter, while the dental laboratory would only be a congenial place for one more delicately organized.

If the demand is such that it is necessary to admit the apprentice into the sacred precincts of the laboratory, we can offer quite as great inducements as other occupations. The ordinary mechanic passes through an apprenticeship of three or four years, usually the former, receiving the first year \$1.50 per week, second year \$3.00 and the third year \$5.00 per week. After serving his time the salary is raised according to the degree of skill acquired, rarely ever getting above \$18.00 per week. All this we can offer, and more. We can promise light labor, short hours, genteel occupation, and if the dental office is

what it should be, refined influences. We can place the young man in a better position socially; we can give him more hours for study if he wishes to enlarge his fund of general knowledge; he can have more time for recreation; in fact, we can give him an honorable and respectable occupation in which he can command quite as much salary as in any trade, under like conditions.

Of course many a mechanic grows out of his journeyman'ship, out of his occupation in fact, by perseverance and development. In the same manner we would occasionally lose a valuable laboratory man, but the majority doubtless would be content. The idea of bringing the dental laboratory down to a competition with the trades may be looked upon by some as unprofessional, and the thought may not be practical, but the writer sees no way to meet the emergency unless the laboratories are thrown open, and young men given a chance. To do this practically there must be a thorough understanding that nothing but mechanical dentistry will be taught; no more study need be required than in any ordinary trade.

Dentists generally look upon students unfavorably, and are disposed to give the colleges the benefit of all applicants. Many a dentist has cause to repent in sackcloth and ashes the conscientious instructions given, when in later years he sees a man stepping into his shoes and reaping the benefit of an acquaintance made with his patients during studentship. Fortunately the time has passed when a student can step out of the laboratory and hang up the sign of a dentist. The mountain-like diploma stands between him and success, and the young man who enters the profession now does so with the intention of taking a place in its ranks, and ere long there will be only temporary assistants who are preparing for college, or who labor between college courses.

Such an idea as this promulgated a few years ago (before the passing of the laws regulating practice), would have been disastrous; it would have opened the doors of respectability to every would-be mountebank, and placed the apprentice on an equal footing with the student. The time is not far distant when all colleges will be obliged to increase their facilities for instructions in the mechanical department, and it would not be a foolish prediction to declare that the time will come when they will teach this as a separate branch, and prepare men for skilled laboratory work alone.

In looking over a practice of twenty years, I am forced to believe that dentistry is just passing the border lines of a second development, which in time will astonish the world. The demands upon us are daily increasing, and the time will come when every man in full practice will find it impossible to accomplish his daily task without

the helping hand of a skilled mechanic. It requires but a glance into the future to see red rubber and other cheap dentures diminishing, and in the onward march of intelligence, metal work will again take its proper place and require of us a full surrender.

Every old root which in years past was consigned to the merciless grip of the forcep, now invites our utmost skill and the handiwork of a mechanic, and day by day we will find the burden heavier, and finally the overwhelming conviction will come that there are no skilled helpers.

This is a matter, gentlemen, worthy of consideration, and not beneath the dignity of our calling.

What are we going to do about it?—*Independent Practitioner.*

SUIT OVER A PATENT.

An interesting argument made in behalf of Elias Smith and Frederick Kimble, of Peoria, Ill., to have Charles A. Eisenhart, of York, Pa., restrained by injunction from infringing upon the complainants' patented dental device, took place to-day before Judge Butler, in the United States Circuit Court. The motion was made by Lawyers Poole & Brown, of Chicago, and was strenuously resisted by William Strawbridge and J. Bonsall Taylor, Mr. Eisenhart's counsel. The patent sued upon was one granted to Mr. Smith in October, 1887, for an electrical dental apparatus, for producing anaesthesia in dental and surgical operations, and included an electrical generator, an induction coil, electrodes, and other devices for generating and applying the current to the parts to be operated upon. The patent had already been sustained in the United States courts in Illinois. In the proceedings to-day Judge Butler refused to grant an injunction, thus practically setting aside the former decisions. The grounds for doing this were that the defence presented was more full than in the Western cases, and the matters relied upon here had not been before the courts in the West. A large number of prior patents were cited, among them being the one granted to William G. Oliver in 1859. This apparatus was shown and adjusted to anticipate the plaintiff's invention. Numerous affidavits made by distinguished physicians and dentists were read. The decision is interesting to the dental profession.—*Philadelphia Ledger.*

—Filled With Woe.—Mistress—Well, Bridget, did you see the dentist? Biddy O'Galway—Yis, ma'am. Mistress—Did he pull your tooth? Biddy O'Galway—Sure, ma'am, he didn't lay a han' to it to pull at all. He scooped it out wid a wee hoe, and thin he druv it in to stay feriver—wid a plug on the top o' it to kape it tight. I'll niver be caught doin' the likes ag'in, ma'am. What with him upsettin' the sate he put me in, an' tyin' a dirty bit av an old gum shoe in me mouth fer a bib, an' makin' a noise the size of a coffee mill in my head, I'd laver walk the flure an' scrame,

INSTRUMENTS AND APPLIANCES FOR THE DENTAL ENGINE.

Any of the following illustrated instruments will fit any Universal Hand Piece in use. They are made either file-cut or stone-cut, and are of the very best quality. They are all hand made.

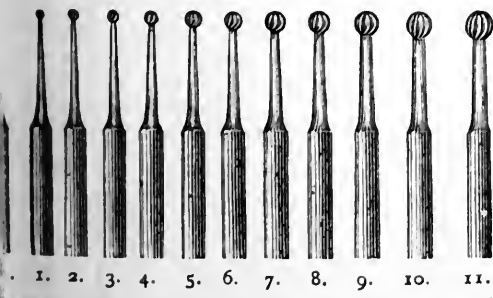
PRICES.

Stone-cut burs,	per doz.,	\$3.00
" with head larger than shaft,	"	4.00
File-cut burs,	"	1.50
" with head larger than shaft,	"	2.00
Honed drills,	"	1.50
Flexible burs and drills,	each,	.35
Twist drills,	"	.30
Corrugated burnishers,	"	.50
Smooth head " "	"	.30
Plug finishing burs, stone-cut,	per doz.,	6.00
" " file-cut,	"	4.20
Huey mandrels, nickel-plated,	each,	.25
Parting nut mandrels, nickel-plated,	"	.25
Screw mandrels, with shoulders, nickel-plated,	"	.20
" without " " "	"	.05
Dr. Clump's porte polisher,	"	.30
Porte polishers, plain,	"	.20
" screw socket.	"	.25
Needle chucks,		1.00

EXCAVATING BURS.

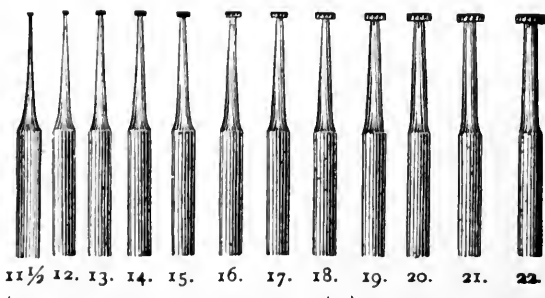
NOTE.—We make burs of each pattern represented, two sizes smaller than the smallest here shown; they are numbered 000 and 00. They are too small to illustrate.

Round.

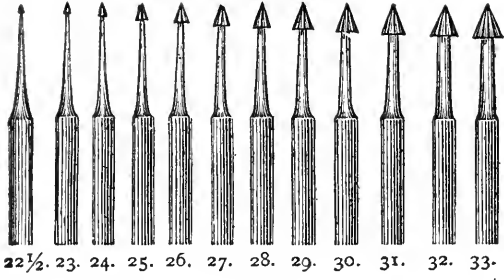


File-cut, 12 1/2 c. each. 16 2/3 c. each.
Honed, 25 c. " 33 1/3 c. "

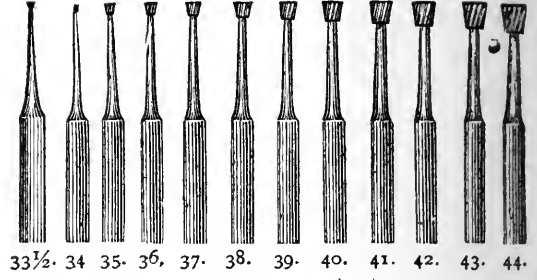
Wheel.



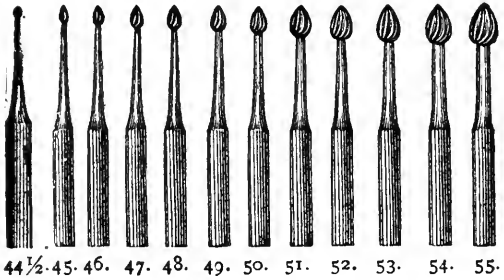
File-cut, 12 1/2 c. each. 16 2/3 c. each.
Stoned, 25 c. " 33 1/3 c. "

Cone.

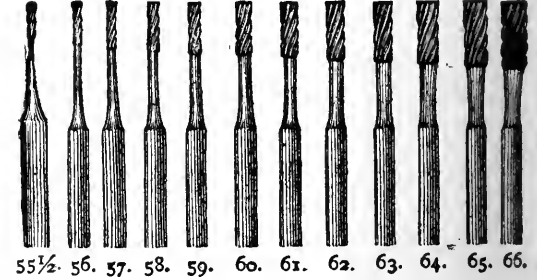
• Stone-cut, 25 c. each. Stone-cut, $33\frac{1}{3}$ c. each.
File-cut, $12\frac{1}{2}$ c. " File-cut, $16\frac{2}{3}$ c. "

Inverted Cone.

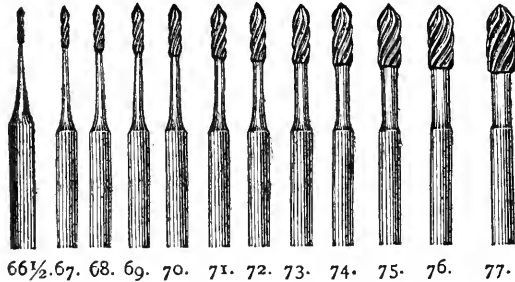
Stone-cut, 25 c. each. Stone-cut, $33\frac{1}{3}$ c. each.
File-cut, $12\frac{1}{2}$ c. " File-cut, $16\frac{2}{3}$ c. "

Bud.

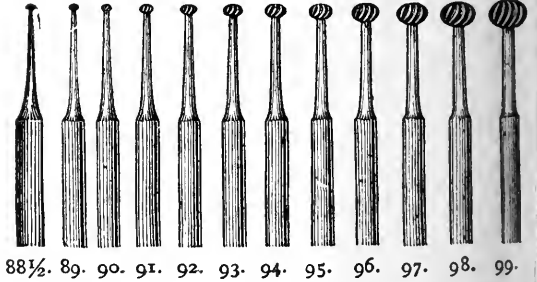
Stone-cut, 25 c. each. Stone-cut, $33\frac{1}{3}$ c. each.
File-cut, $12\frac{1}{2}$ c. " File-cut, $16\frac{2}{3}$ c. "

Fissure, Square End.

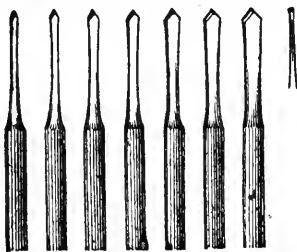
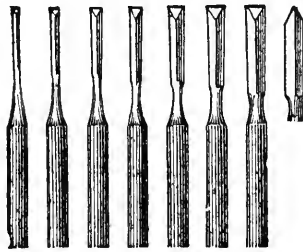
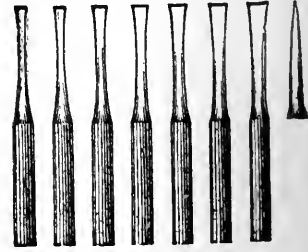
Stone-cut, 25 c. each. $33\frac{1}{3}$ c. each.
File-cut, $12\frac{1}{2}$ c. " $16\frac{2}{3}$ c. "

Fissure Pointed.

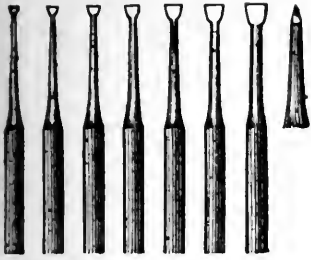
Stone-cut, 25 c. each. Stone-cut, $33\frac{1}{3}$ c. each.
File-cut, $12\frac{1}{2}$ c. " File-cut, $16\frac{2}{3}$ c. "

Oval.

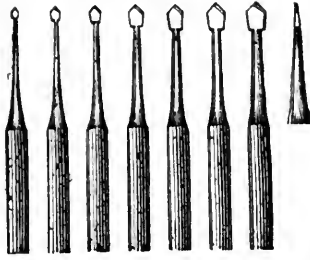
Stone-cut, 25 c. each. Stone-cut, $33\frac{1}{3}$ c. each.
File-cut, $12\frac{1}{2}$ c. " File-cut, $16\frac{2}{3}$ c. "

DRILLS.**Flat Spear Point.****Square.****Flat Square Point.**

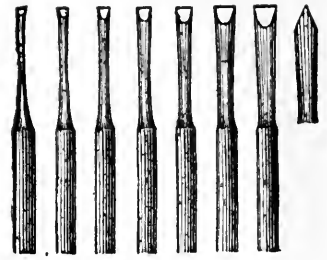
$12\frac{1}{2}$ cents each, or \$1.50 per doz.

Spade.

121. 122. 123. 124. 125. 126. 127.

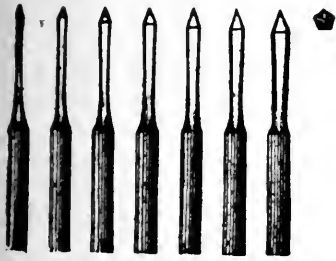
Forbes's.

128. 129. 130. 131. 132. 133. 134.

Round.

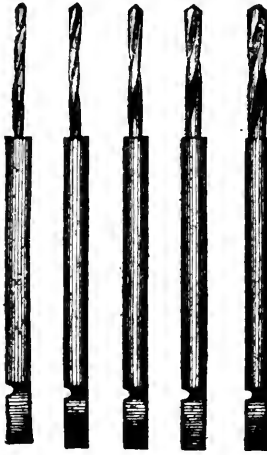
135. 136. 137. 138. 139. 140. 141.

12½ cents each, or \$1.50 per doz.

Twist Drills. Trephines.**Five Sided.**

142. 143. 144. 145. 146. 147. 148.

12½ cents each.

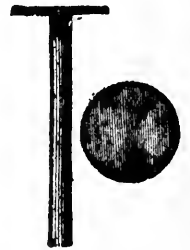


150. 151. 152. 153. 154.

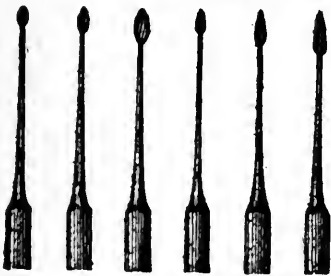
30 cents each.



60 cents each.

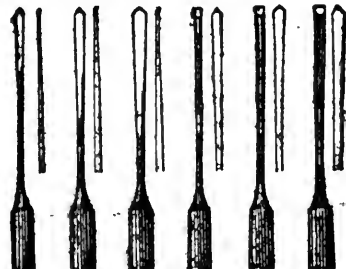
Plate Saws.

75 cents each.

"Flexible" Burs and Drills.

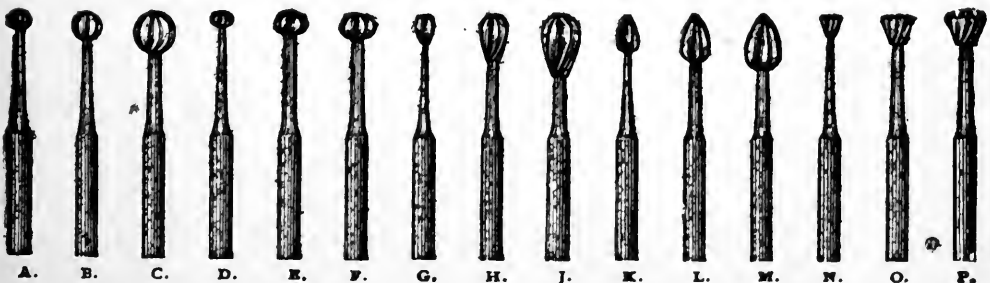
155. 156. 157. 158. 159. 160.

35 cents each.



161. 162. 163. 164. 165. 166.

35 cents each.

BURNISHERS.

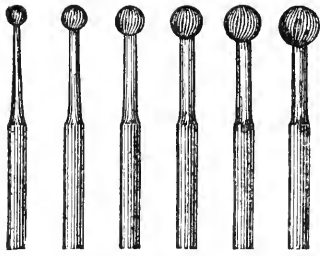
A. B. C. D. E. F. G. H. J. K. L. M. N. O. P.

Corrugated as shown in cut, 50 cents each

With smooth heads (greatly preferred by some operators), 35 cents each.

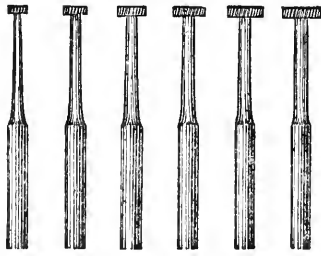
PLUG FINISHING BURS.

Round.



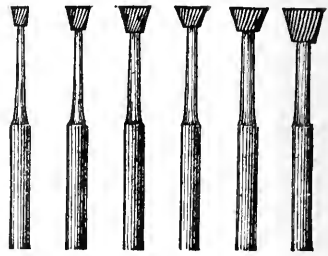
200. 201. 202. 203. 204. 205.

Wheel.



206. 207. 208. 209. 210. 211. 212.

Inverted Cone.

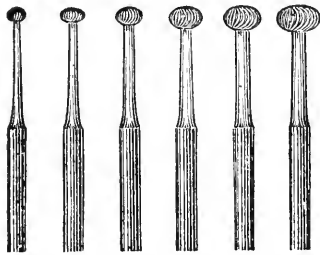


213. 214. 215. 216. 217.

Stone cut, \$6.00 per dozen.

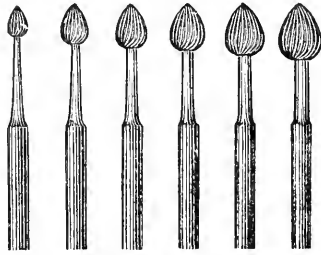
File-cut, \$4.20 per dozen.

Oval.



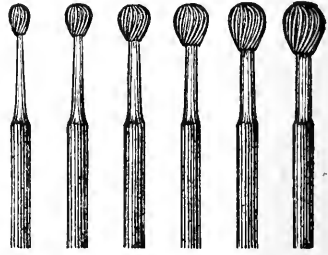
218. 219. 220. 221. 222. 223. 224.

Bud.



225. 226. 227. 228. 229.

Pear.

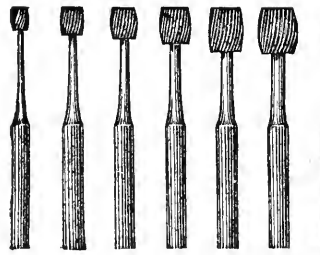


230. 231. 232. 233. 234. 235.

Stone-cut, \$6.00 per dozen.

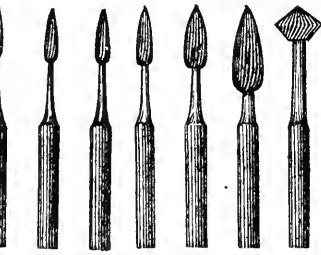
File cut, \$4.20 per dozen.

Barrel.



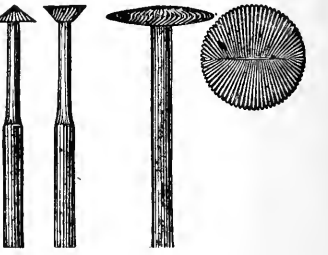
236. 237. 238. 239. 240. 241.

Sugar Loaf.



242. 243. 244. 245. 246. 247.

Knife Edge.



248. 249. 250.

Stone-cut, \$6.00 per dozen.

File-cut, \$4.20 per dozen.

Price, \$1.23 each.

Paring-Nut Mandrel.



25 cents each.

Porte Polisher, Plain Socket.



20 cents each.

Screw Mandrel, with Shoulder.



20 cents each.

Porte Polisher, Screw Socket, Nickel Plated.



Screw Mandrel without Shoulder.



5 cents each.

Screw Head Mandrel

Invention of Dr. Robert Huey.



25 cents each.

Screw Clamp, Porte Polisher.

Invention of Dr. G. W. Klump.



30 cents each.

FELT DISKS.

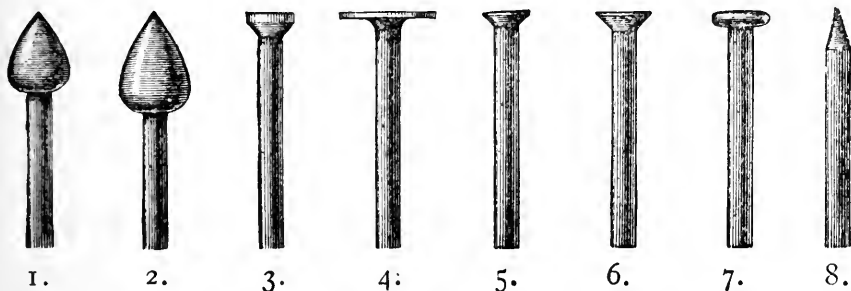
DR. W. W. SMITH'S PATENTS.

Made of thin felt, prepared so as to give them sufficient firmness for use, and yet allow them the necessary pliability to prevent their breaking easily. The material is superior for carrying polishing powders, and they will polish a tooth well and quickly. Size, $\frac{7}{8}$ of an inch in diameter.

Price, each, \$0.10

APPLIANCES WHICH CAN BE USED WITH ANY MAKE OF DENTAL ENGINE.

WOOD POLISHING POINTS.



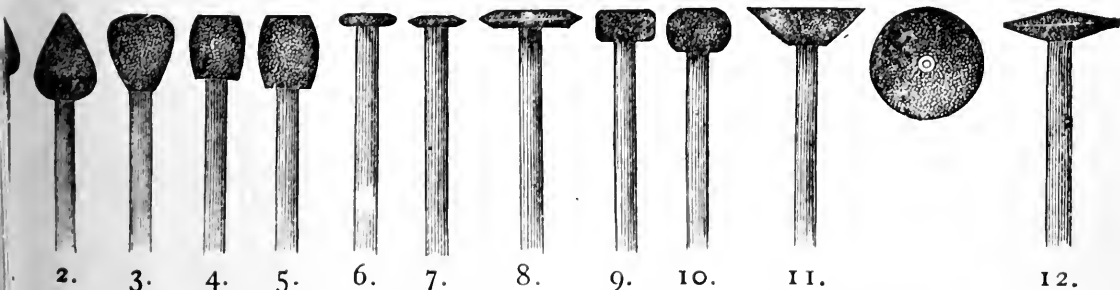
Put up in boxes containing 100 points each.

Assorted, eight forms,	per box, \$1.00
No. 1, separately, per box, \$1.50	No. 5, separately, per box, .75
" 2, " " 1.50	" 6, " " .75
" 3, " " .75	" 7, " " 1.25
" 4, " " 2.40	" 8, " " .50

CORUNDUM POINTS.

DR. A. L. NORTHROP'S DESIGNS.

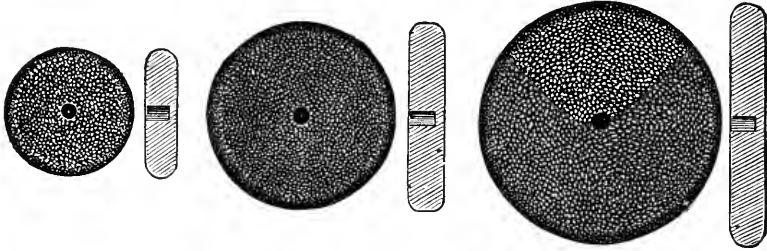
Set of twelve.



Points, not mounted,	per doz., \$0.65
Mounted on mandrels,	" 1.25
Butler's Corundum Points for porte polishers,	" .65

"STUMP" CORUNDUM WHEELS.

We here illustrate three new styles of Corundum Wheels. They are intended to use with Dental Engine, for pivoting and for cutting off projections of natural teeth.



A.

B.

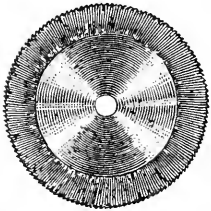
C.

Per Doz.

A.—Round edge, $\frac{1}{2}$ in. diameter, $\frac{1}{8}$ in. thick (see cut),	. .	\$1.00
B.—Round edge, $\frac{3}{4}$ in. diameter, $\frac{1}{8}$ in. thick (see cut),	. .	1.00
B.—Square edge, $\frac{3}{4}$ in. diameter, $\frac{1}{8}$ in. thick,	. . .	1.00
C.—Round edge, 1 in. diameter, $\frac{1}{8}$ in. thick, (see cut),	. .	1.20

EMERY PAPER, SAND PAPER, AND CUTTLE FISH PAPER DISKS.

Price of either grade (100 in a box), . . . per box, \$0.25

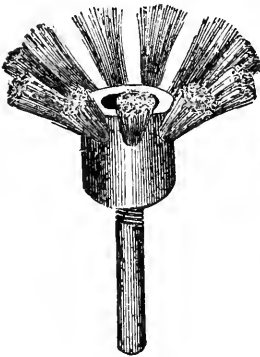


CIRCULAR SEPARATING FILE.

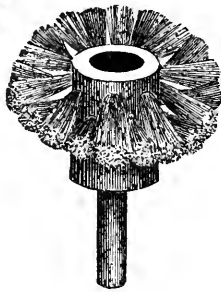
For use with the Dental Engine.

		Each.
Cut on one side,	. . . . .	\$0.25
Cut on both sides,	. . . . .	.25

TOOTH BRUSH WHEELS.



1



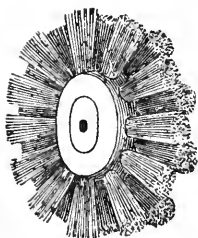
2

Cut exact size of wheels.

For use with the Dental Engine in cleaning Teeth and Polishing Fillings.

They are made with celluloid centre, and strong stem for use with the Porte polisher.

No.	Each.
1, cup shape, one row bristles,	\$0.20
2, straight, two rows bristles,	.25



Cut exact size of wheel.

WIRE WHEEL BRUSH.

For Cleaning Engine Burs and Files.

Price, steel wire, 1 in. diameter, 2 R,	. . .	\$0.50
" brass " 1 in. diameter, 2 R,	. . .	.50
Screw mandrel, for mounting wire wheels,	. .	.20

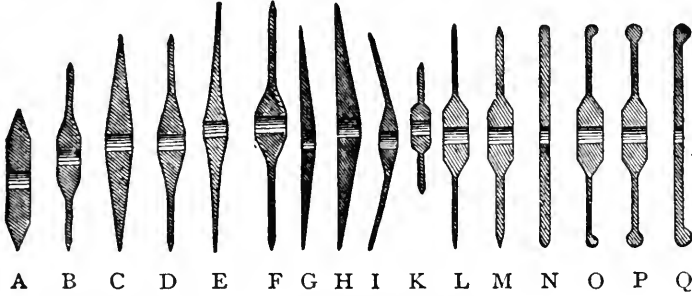
SMALL FELT CONE FOR THE ENGINE.

FOR POLISHING FILLINGS, &c.

Size 1 inch long by 7-16 inch diameter. Each, 7 cts.; per dozen, 75 cts.

DR. R. ARTHUR'S CORUNDUM DISKS.

FOR PERMANENTLY SEPARATING AND POLISHING THE TEETH.

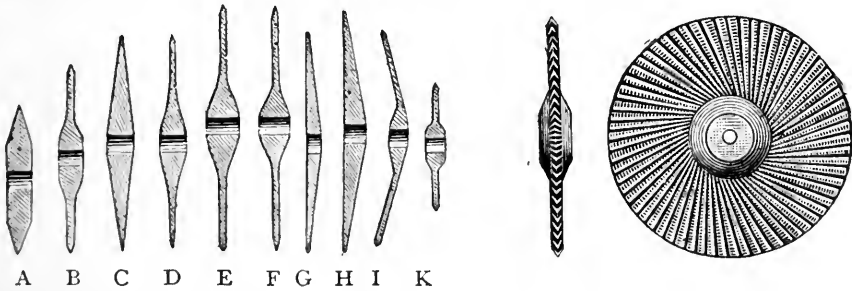


A and K, not mounted, each, 13 cents; per doz.,	.	.	.	\$1.40.
All others, " " " 25 "	.	.	.	2.75
A and K, mounted, " 23 "	.	.	.	2.50.
All others, " " 35 "	.	.	.	3.75
Not mounted, per set—6, A to F,	.	.	.	1.25
Mounted, " 6, A to F,	.	.	.	1.75
Not mounted, " 10, A to K,	.	.	.	2.00
Mounted, " 10, A to K,	.	.	.	2.90.

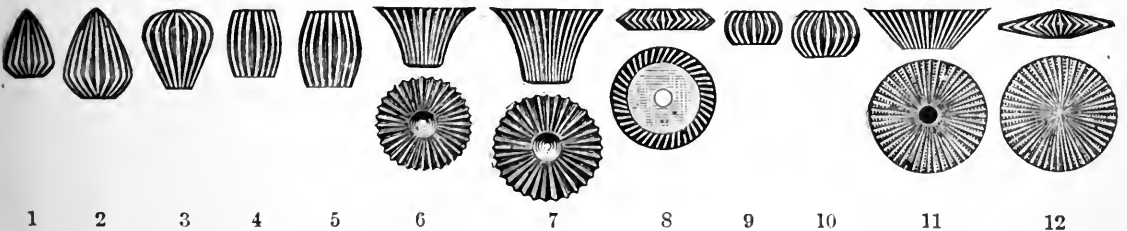
CORRUGATED SOFT RUBBER DISKS AND POINTS.

SUGGESTED BY DR. C. E. FRANCIS.

Pronounced by many superior to the plain surfaces. They are used for carrying powders, of polishing natural teeth and finishing fillings.



Price, Disks A to K, not mounted,	.	.	.	.	each, \$0.05
" screw head mandrels for mounting Disks,	.	.	.	.	" .25



Points, Nos. 1 to 12, not mounted,	.	.	.	.	per doz., \$0.40
" " " " " "	.	.	.	.	each, .04

SHELLAC FOR MOUNTING.

To facilitate the mounting of disks and points, we have had shellac prepared in sticks, $\frac{1}{4}$ inch diameter by 3 inches long, put up in boxes of twelve sticks; also prepared in powder for same purpose.

Price, in sticks,	per box, \$0.25
“ powder,	“ box .10

OIL FOR THE DENTAL ENGINE.

After years of patient and exhaustive experimenting, we have at last succeeded in producing a lubricant for dental engines, which leaves nothing to be desired. A single trial will convince the purchaser of its great superiority over all other so-called *Dental Engine Lubricants* in the market. It is delicately perfumed.

Price,	per bottle, \$0.25
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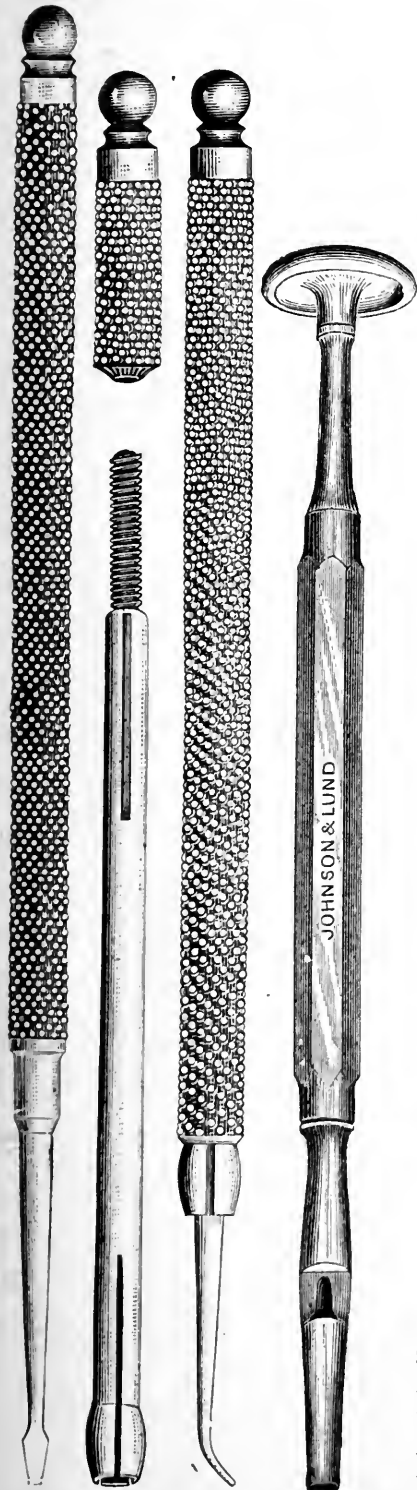
TOOTH POLISHING BRUSH.

FOR USE WITH DENTAL ENGINE.

Very useful in cleansing teeth from discoloration, even under the free border of the gums, also in polishing the cervical margins of fillings. It is sold at such a very low price, that the safe and cleanly practice of throwing the brush away after operation, may be safely indulged in. Made in three grades—soft, medium and stiff.

Price, each,	\$0.04
“ per doz.,	40

ENGINE BIT SOCKETS AND SCREW DRIVER.



Screw Driver, 50 cents each.
 Universal Socket, \$1.25 each.
 Revolving Head Socket, 75 cents each.

IMPROVED UNIVERSAL

ENGINE BIT HOLDER.

Suggested by Dr. S. W. Dennis.

This very useful instrument will grasp firmly all forms of engine bits and plugger points. The holder is furnished with a slot and pin, which prevent the socket from revolving when the bit is being adjusted.

Price, nickel plated, . . . each, \$1.25

REVOLVING HEAD SOCKET.

This socket is made of steel and heavily nickel-plated. The head revolves independently. It will accommodate any bit, except the cone journal hand piece bits, and bits made of the same size wire as the cone journal hand piece bit

Price, nickel-plated, . . . each, \$0.75

SCREW DRIVER.

This is a very handy tool for handling small screws of hand pieces, and other light machinery.

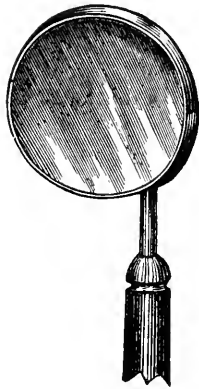
Price, nickel-plated, . . . each, \$0.50

MOUTH MIRRORS.

(Long Handles.)



Small.



Medium.



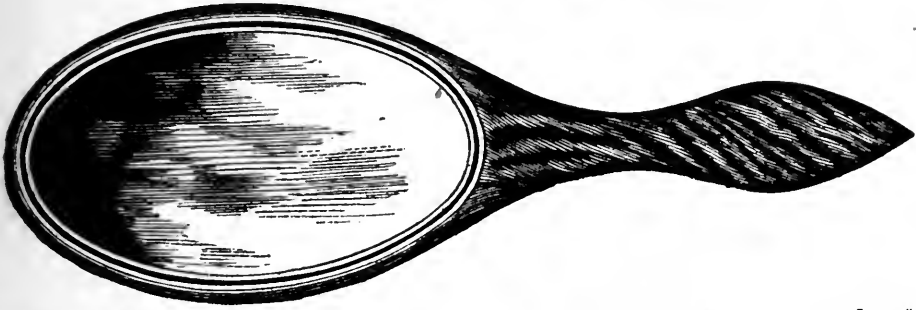
Large.

We here represent a mouth mirror with a long ebony handle, smoothly and delicately made ; the frames are nickel-plated, and the glasses are fitted in the frames in a workmanlike manner. The glasses are the finest that can be obtained. They are coated with pure silver instead of the amalgam usually used in coating mirrors, and are then backed with a preparation which renders them in a greater degree impervious to moisture than any other yet produced. If the glasses at any time should become movable in their setting, they should be rubbed tight by burnishing the rim. In warming the glasses, either in flame or in water, great care should be taken not to heat the glass through, as the unequal expansions of glass and metal will cause the silver upon the back of the glass to flake. We make these glasses, both plain and magnifying, in three diameters, $\frac{3}{8}$ inch, $\frac{7}{8}$ inch and 1 inch.

PRICES.

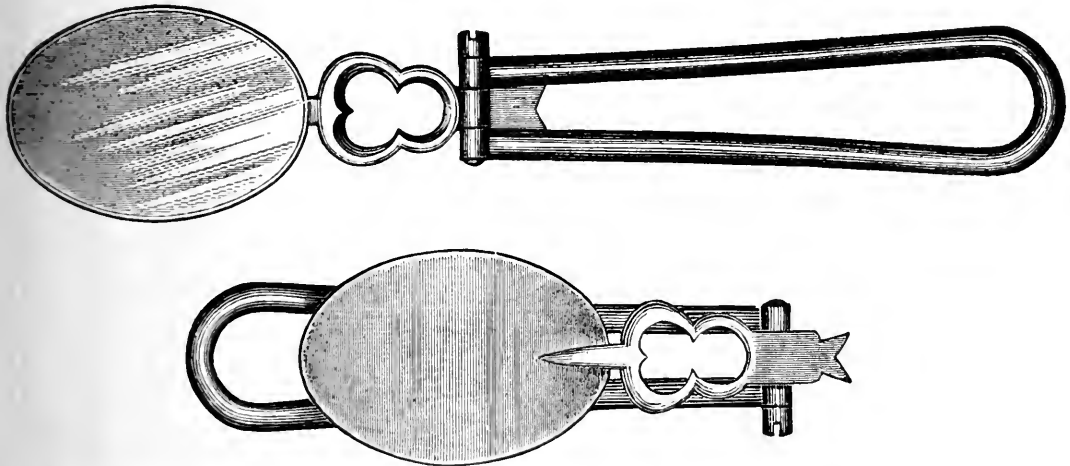
Plain glass, either size, ebony handle,	each, \$1.00
Magnifying glass, either size, ebony handle,	" 1.50

ROSEWOOD MOUTH MIRRORS.



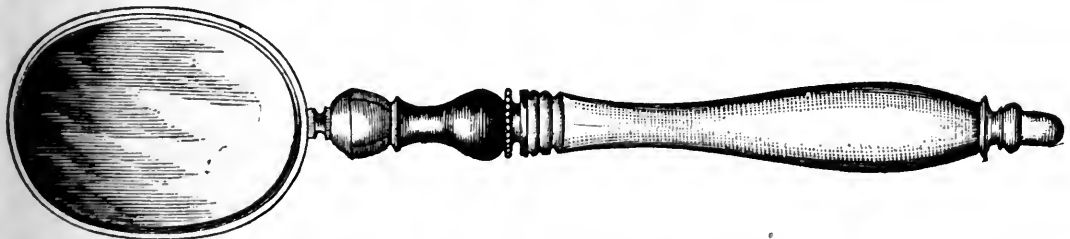
Rosewood Mouth Mirror, plain glass, short handle, - each, \$0.25

MAGNIFYING POCKET MIRRORS.



Price, german silver frame, oval glass, jointed, magnifying, each, \$2.00

BALL AND SOCKET MOUTH MIRRORS.



Bone handle ball and socket magnifying Mouth Mirror, - - \$2.00

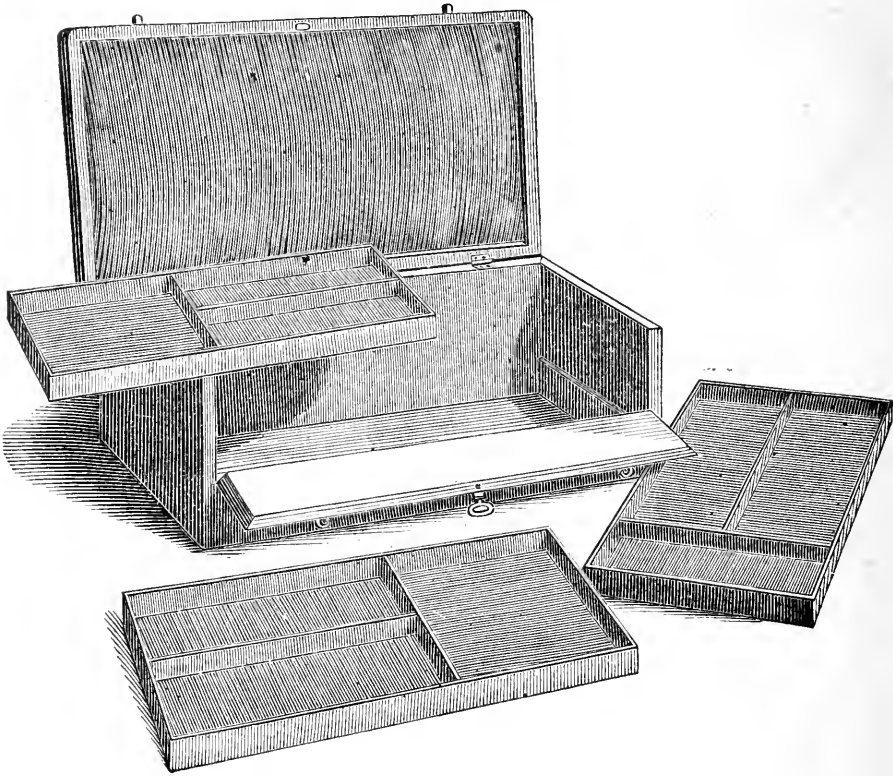
HAND MIRRORS.

								Each.
Rosewood,	plate glass,	4½ inches,	-	-	-	-	-	\$0.75
"	"	5	"	-	-	-	-	.85
"	"	5½	"	-	-	-	-	1.00
"	"	6	"	-	-	-	-	1.20

BEVEL-EDGE HAND MIRRORS.

								Each.
Rosewood,	4 inches;	-	-	-	-	-	-	\$1.25
"	5	"	-	-	-	-	-	2.00
"	6	"	-	-	-	-	-	2.50

STUDENT'S DENTAL CASES.



Intended more especially for students, although the larger size, when fitted with instruments, makes a very convenient traveling case. They are all lined with cotton velvet, and are all fitted with lock and key. All measurements are outside.

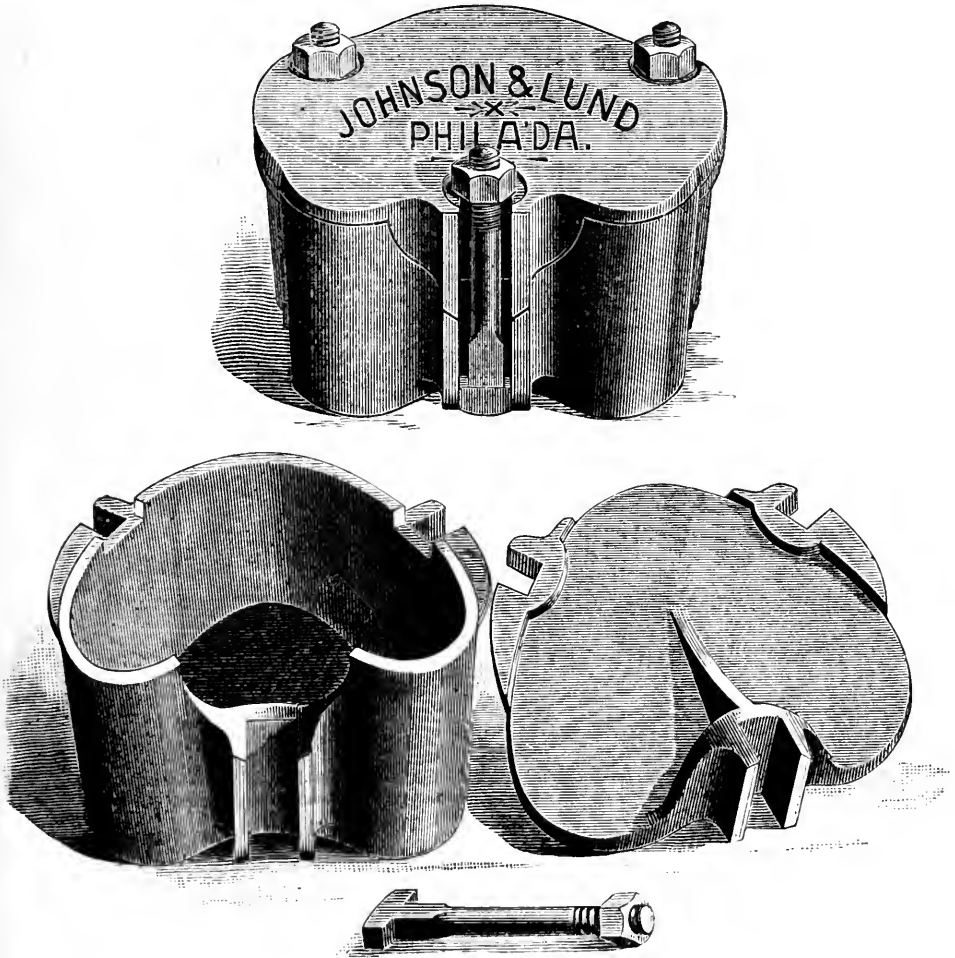
No. 1.	Walnut Varnished,	10 inches long, by 6 inches wide, by 4 inches high,	\$5.00
" 2.	"	11 inches long, by 7 inches wide, by 4½ inches high,	6.50
" 3.	"	12 inches long, by 9 inches wide, by 5 inches high,	8.00
" 4.	"	14 inches long, by 9 inches wide, by 5½ inches high,	11.00

PASTEBOARD TEETH CASES, FOR MAILING ARTIFICIAL SETS.

Oblong, 3 inches long, by 2½ inches wide, by 1¼ inches deep, made of heavy pasteboard, covered with morocco paper, fitted with a semi-circular partition inside to prevent the set being shaken about during transportation. The shape of the outside being a square oblong makes a very handy package for mailing.

Price, per dozen, \$0.60

DR. M. L. LONG'S
FLASK FOR VULCANIZING
 PARTIAL CASES AND REPAIR JOBS.



This flask is intended for partial cases; cases where the tooth rests against the natural gum, temporary sets where no rim is intended to be *on the outside* and for repair cases of either vulcanite or celluloid.

For partial cases grind the teeth so they will rest against the model and secure them to the base plate. Fill the flask nearly full of plaster, and press the model, with the teeth attached to the base plate into this, until the plaster rises above the cutting edges of the teeth, which should be below the edge of the flask so that the cover will fit over without touching the teeth. The edges of the teeth should be at least a *quarter* not less than an *eighth* of an inch *below* the edge of the flask. The flask is intended for all cases where the packing of the rubber is done *from the inside*. When the model is buried into the plaster within the flask, the plaster that rises in excess is scraped off flush with a strait edge from the back to the front of the flask. The plaster is now made flaring so that what is added and adheres to the cover may part easily. When the plaster sets it is varnished and oiled, and plaster poured on and the cover set in place. When hard separate the parts, remove the base plate and all adhering wax around the pins of the teeth, pack and vulcanize. The same directions apply for repair cases.

Price, Malleable Iron, - each, 75 cents.



1000 FINE

JOHNSON & LUND'S
DOUBLY REFINED

**EXTRA TOUGH
GOLD FOIL.**

PHILADELPHIA 620 RACE ST. **DENTAL DEPOTS** CHICAGO 514 WABASH AVE

COHESIVE. EXTRA-COHESIVE.
SOFT OR SEMI-COHESIVE.

Each Grade Uniform in Quality. Does not Ball up under the plugger. Its absolute purity is unquestioned.

Nos. 3 to 240.

Works with the utmost smoothness. Exhibits great softness under the burnisher. Possesses a wonderful amount of durability and toughness.

PRICE.

Per $\frac{1}{8}$ ounce,	-	-	\$4 00	Per $\frac{1}{2}$ ounce,	-	-	\$15 00
" $\frac{1}{4}$ "	-	-	7 75	" 1 "	-	-	30 00

Steurer's Plastic Gold.

We respectfully call attention to a new form of **Dental Gold**, that we have introduced to the profession under the name of "STEURER'S PLASTIC GOLD."

It is a chemically pure Gold in a plastic state, without admixture of any foreign substance, of a brown color and homogeneous appearance.

We claim the following advantages over all other forms of Gold heretofore used:—

1st. It is more cohesive.

2nd. It has a spreading quality before it is completely condensed, so that it can be moulded into any cavity.

3rd. A tooth can be filled in one-third of the time it takes with any other Gold, simple hand pressure being sufficient to make a solid filling, the mallet (which is so disagreeable to most patients) can be dispensed with, and sensitive teeth, or those whose walls are frail, can be easily filled.

Beware of worthless imitations. Be careful to see that it is in the shape of small square pieces, packed in bottles, and labeled *Steurer's Plastic Gold*, because the imitations, although they may apparently work tolerably in the commencement, do not make a solid filling, but gradually crumble away.

AS WE HAVE TO PAY CASH FOR THE GOLD AND THE MARGIN
IS SO SMALL, WE MUST SELL FOR CASH ONLY.
PLEASE SEND CASH WITH ORDER.

Price Per Bottle, 1-16 oz., \$2 50. Sent postage free on receipt of price.

JOHNSON & LUND, DENTAL DEPOTS.

620 Race Street, Philadelphia.

514 Wabash Avenue, Chicago.

1,000 FINE Extra Tough Gold Pellets.

Nos. 1-4, 1-2, 3-4, 1, 1 1-2, 2, and assorted

\$4.00 per $\frac{1}{8}$ ounce.

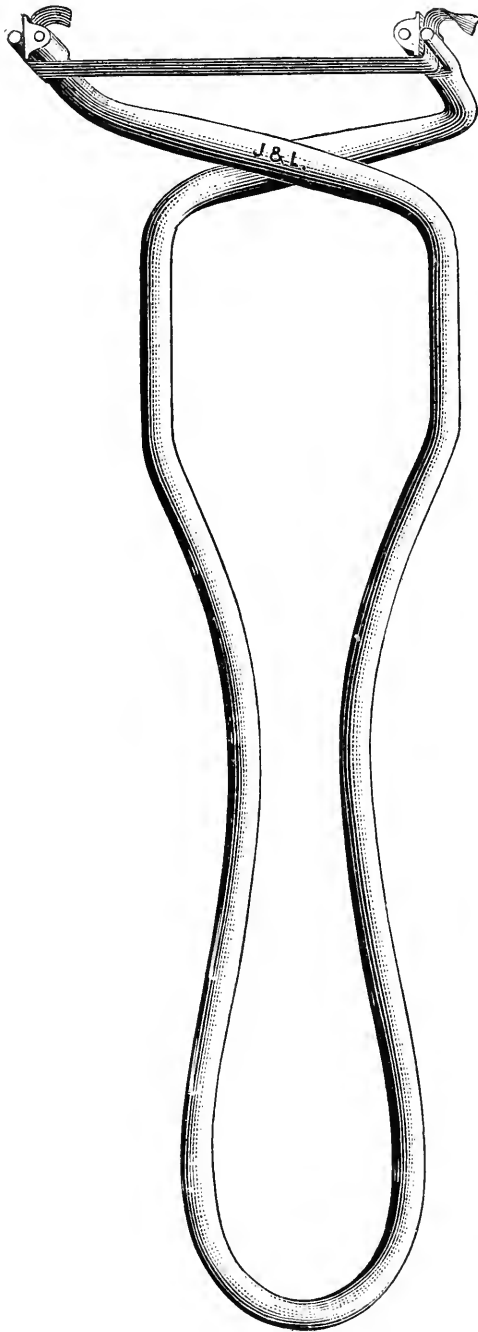
\$30.00 per ounce.

JOHNSON & LUND,

620 Race Street, Philadelphia.

514 Wabash Avenue, Chicago.

Dr. M. L. LONG'S POLISHING STRIP CARRIER.



Cut full size.

The above appliance will be found very handy in using polishing strips between the molars and bicuspsids. All steel, nickel-plated.

Price, each, - - - - - \$1.75.

It Retains its Brightness.

It works with great Plasticity, and packs densely.

Oz. Troy.

Extra Amalgam.

GOLD AND

JOHNSON & LUND
LABOR OMNIA VINCIT.

PLATINA ALLOY.

TRADE MARK.
JOHNSON & LUND.

SOLE PROPRIETORS,
620 RACE ST., PHILADELPHIA.
514 WABASH AVE., CHICAGO.

It possesses the greatest possible freedom from shrinkage.

Impervious to the Secretions of the Mouth.

PRICES.

One	Ounce Package	\$ 3.00
Two-thirds	" "	2.00
One-third	" "	1.00
Two Ounces, purchased at one time	. . . . .	5.40
Three	" " " "	7.65
Four	" " " "	9.75
Five	" " " "	11.75
Ten	" " " "	20.00

When money accompanies the order, the Amalgam will be sent postage free.

REDUCTION IN PRICES.

RUBBER BOWL FOR MIXING PLASTER.



These bowls are made of soft rubber, almost one-eighth of an inch thick. They cannot be broken. Their sides can be pressed together so as to form a lip or spout for pouring out soft plaster. The plaster that remains in them and becomes set can be thoroughly crushed and removed by squeezing the sides of the bowl together.

Inside measurement, $4\frac{1}{4}$ inches in diameter by $3\frac{1}{8}$ inches in depth.

PRICE, 60 CENTS EACH.

POSSESSES THE GREATEST FREEDOM FROM SHRINKAGE.

IT RETAINS ITS BRIGHTNESS.



oz. Troy.
EXTRA TOUGH
GOLD
 AND
PLATINA ALLOY

A notable Tooth Saver.

The proportions of Gold and Platina in this Alloy with the Combination of Silver, Tin, &c., cause it to harden quickly and to maintain its edge strength. Use as little Mercury as will make a stiff plastic filling, and place in cavity without washing.

JOHNSON & LUND,

SOLE AGENTS,

620 Race St., Philada.

514 Wabash Ave., Chicago.

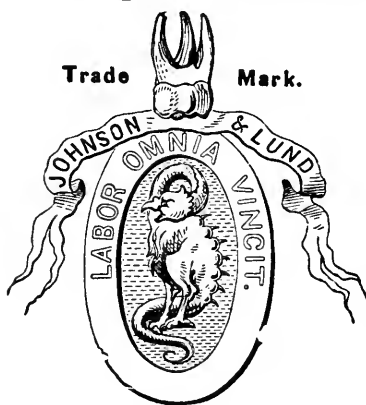
WORKS WITH GREAT PLASTICITY AND PACKS DENSELY.

IMPERVIOUS to the SECRETIONS of the MOUTH.

PRICES.

Per ounce	\$ 3.00
" half ounce.....	1.50
" two ounces purchased at one time.....	5.40
" three " " "	7.65
" four " " "	9.75
" five " " "	11.75
" ten " " "	20.00

When money accompanies the order, the Amalgam will be sent postage free.

Virgin White Alloy for Front Teeth.

The prominent qualities of this Alloy are its WHITENESS and FREEDOM FROM SHRINKAGE. Fillings made of this Amalgam, in tubes five or six times the diameter of those usually employed in the "leakage test," with blue or purple ink, give no perceptible indications of permeation of fluid. Though designed especially for front teeth, yet it will stand mastication well anywhere in the mouth. For crown cavities, however, we recommend the EXTRA TOUGH GOLD AND PLATINA ALLOY, as that is made with special regard to edge strength.

PRICES.

Per ounce	\$2.00
" half ounce.....	1.00
" two ounces purchased at one time	3.80
" three " " "	5.40
" four " " "	6.80
" five " " "	8.00
" ten " " "	15.00

When money accompanies the order, the Amalgam will be sent postage free.

Dentists' Amalgam.

"Those things called dear are, when justly estimated, the cheapest."



THE
DENTISTS' AMALGAM,



PREPARED BY

Dr. J. W. MOFFITT.

It is composed of pure metals only. It contains no Cadmium or Bismuth. It will not discolor the teeth, or shrink from the cavity walls; in a word, it will not EXPAND, CONTRACT, or OXIDIZE. It requires LESS MERCURY in the process of Amalgamation than any other. For TOUGHNESS, STRENGTH, and RESISTANCE it has no equal.

Price, per Ounce,	-	-	-	-	-	\$5.00
" " Half Ounce,	-	-	-	-	-	2.50
" " Quarter Ounce,	-	-	-	-	-	1.25

"Prove all things, and hold fast to that which is good."

Metals, such as Cadmium and Bismuth, are not used in the manufacture of the DENTISTS' AMALGAM. This secures to the purchaser a greater bulk per ounce than in other Alloys.

This Amalgam having been thoroughly tested during the past quarter of a century and approved by the best practitioners, we deem it unnecessary to offer any of the numerous testimonials we have to sustain its already well-earned reputation.

JOHNSON & LUND,

20 Race Street, Philadelphia.

514 Wabash Avenue, Chicago.

Sole Agents.

A Phosphate of Zinc.

Prize Package containing 1 color,	\$1.00
“ “ “ 2 clors,	1.50

Each package of the "Onyx" Cement will contain a small piece of the 'Asbestos Felt,' so that the operator may have an opportunity of testing its value.

PHOSPHATE OF ZINC.

PREPARED BY DR C. N. PEIRCE.

The packages will contain a small piece of ASBESTOS FELT, so that those desiring may have the opportunity of testing its value as a lining for cavities, and as a nerve cap.

Price, per package,	-	-	-	-	\$2.00
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JAPANESE BIBULOUS PAPER.

REDUCTION IN PRICE.

Our Own Importation.

We are just in receipt of a large invoice of Japanese Bibulous paper direct from Yokohama. By importing this absorbent directly from Japan, we save the profits which we have heretofore been obliged to pay to the importers, which enables us to have the pleasure of announcing to the profession a further reduction in price.

Price, per 100 Sheets,	-	-	-	-	-	-	-	\$.40
" " 500 "	-	-	-	-	-	-	-	1.75

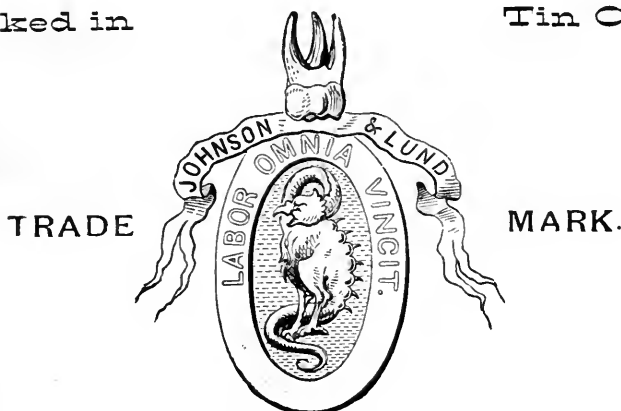
RUBBER DAM IN TINS.

1-2 Pound, \$1.50.

Extra Tough Coffer-Dam Rubber.

Packed in

Tin Cans.



Manufactured expressly for

JOHNSON & LUND,

620 RACE ST., PHILA.

514 WABASH AVE., CHICAGO.

We take pleasure in calling the attention of the profession to a new article of Rubber Dam, made in the most careful manner of the best Para Rubber, no adulteration being used in the manufacture, the Dam consisting entirely of Rubber, sufficient of sulphur only being used to properly vulcanize it. It is cut in strips $8\frac{1}{2}$ inches wide and from $3\frac{1}{2}$ to 4 yards long, being a very handy size for general use. It is packed in METAL TUBES, with a MOVABLE LID made as nearly AIR TIGHT as possible, in which the Dam can be kept, thus assisting very materially in preserving the strength of the material.

Price.

Per can containing $\frac{1}{2}$ lb.	Thin	per yard, \$1.00
" " $\frac{1}{2}$ "	Medium	" 1.50
" " $\frac{1}{2}$ "	Thick	" 2.00

Sent Postage Free on receipt of price.

RUBBER DAM BY THE YARD.

35 Inches Wide. There is none made wider.

The Best Coffer-Dam Rubber.

Impossible to make any better. 35 inches wide.

The above Rubber Dam is made especially for us and to our own particular order, so that we know just what we offer to the profession, and what we know is, that it is impossible to make any better. Some time since we were obliged to buy some Coffer-Dam Rubber, which was advertised as a VERY SUPERIOR ARTICLE, to supply a customer who was impressed with the advertisement of the same. The result was that he found it tender, and returned it to us unfit to be used. We replaced it with our own, with which he was very well satisfied.

Thin	per yard, 1.00
Medium	" 1.50
Thick	" 2.00

—CAUTION:—

Much of the Coffer-Dam Rubber advertised by other depots and offered by their travelers is but $26\frac{1}{2}$ inches wide, is 20 per cent. less material to the yard than ours. For instance, our Medium 35 inches wide at \$1.50 per yard is as cheap as $26\frac{1}{4}$ inches of equal quality would be at \$1.12 $\frac{1}{2}$ per yard.

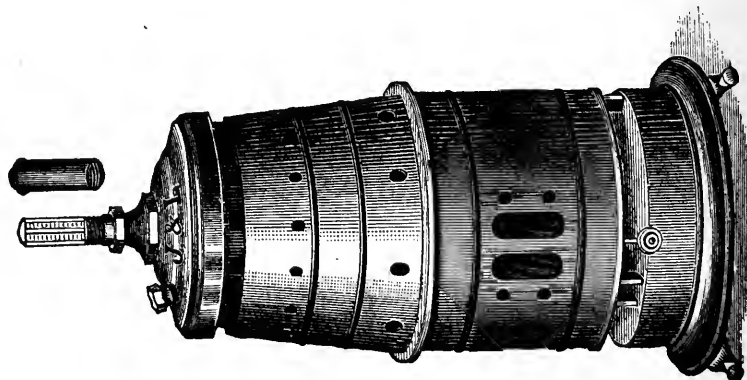
JOHNSON & LUND,

620 Race St., Philada.

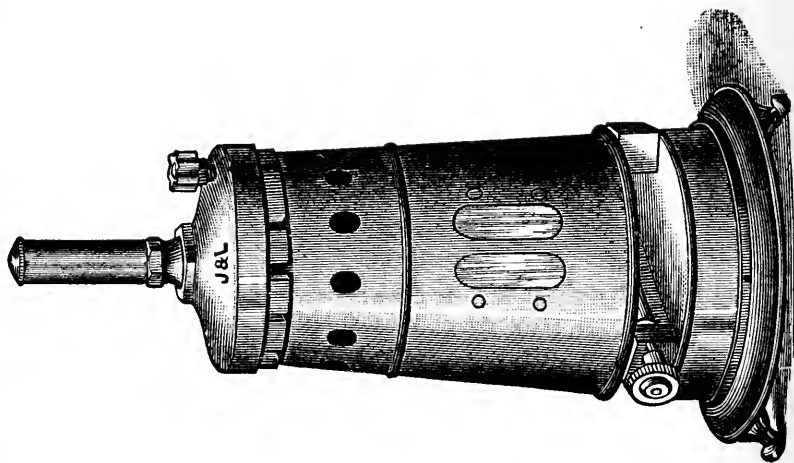
514 Wabash Ave., Chicago.

IMPROVED VULCANIZERS,

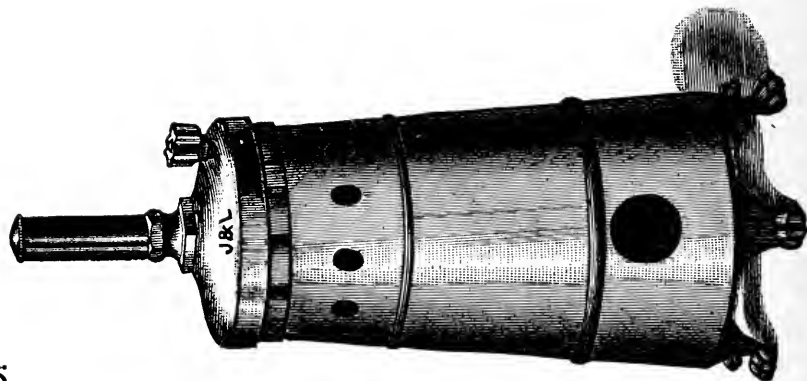
MERCURY BATH, BRASS, FLASKS, ETC.



OUTFIT A.
 Rigged for kerosene with Union stove.
 One-case complete with Anchor Flasks, etc. \$14.00
 Two-case ditto 15.00
 Three-case ditto 16.00



OUTFIT B.
 Rigged for kerosene with new attachment.
 One-case complete with Anchor Flasks, etc. \$13.00
 Two-case ditto 14.00
 Three-case ditto 16.00



OUTFIT C.
 Rigged for gas or alcohol.
 One-case complete with Anchor Flasks, etc. \$13.00
 Two-case ditto 14.00
 Three-case ditto 15.00

Improved Vulcanizers, Mercury Bath, Brass Flasks, Etc.

These vulcanizers are made in the general style of the "Whitney." The boilers are of extra thick copper, and made much wider than those in ordinary use. The inside diameter of the JOHNSON & LUND Vulcanizer measures fully 4½ inches, while the "Whitney" and "Hayes" measure but 4 inches. The great advantage of this increased diameter will be appreciated at a glance, as it enables the dentist to use the largest size of flasks when necessity demands it. That the profession may be thoroughly satisfied of the ample strength of these vulcanizers, we assure them that each boiler has been tested by and sustained a hydrostatic pressure of 500 lbs., to the square inch; and as the elastic force per lb. to the square inch at 320° Fahrenheit (the degree at which dental plates are generally vulcanized), is but 88 lbs., our Vulcanizers are capable of resisting more than six times the strain required. But this liberality of resisting power is no excuse for carelessness on the part of the operator.

Johnson & Lund's Improved Vulcanizers are furnished with thermometer, mercury bath, one packing in place and an extra piece, extra disks, for the safety-valve, requisite number of wrenches, malleable iron or brass flasks at option of purchaser. When no flasks are mentioned the brass ones will always be sent with the apparatus. We especially call attention to the flasks furnished with these Vulcanizers. They are of the pattern known as the **ANCHOR FLASKS**. Owing to their peculiar formation, an extra amount of room is afforded for the case to be vulcanized, and the bolts can be detached and replaced with great facility, without removing the screw from the nut.

PRICES.

Donham's Spring Pressure fitted to a Vulcanizer, adds \$1.25 to the Price.

NOTE.—The kerosene burner we are now furnishing with our Vulcanizer has but one burner; but that burner is four inches wide, instead of only two inches wide, which is the size of the burner belonging to the No. 1 Union Stove. This increased size makes the new burner equal to the two-burner stove, and at no increased expense.

One-case Vulcanizer, copper boiler, furnished with thermometer, packing jacket, lamp, disks for safety-valve, two flasks (either malleable iron or brass, at the option of the purchaser), and wrenches—complete for alcohol	\$13 00	No. 1 Union Kerosene Stove, with one burner two inches wide	\$2 00
Ditto—complete for gas	13 00	" " " " four inches wide	2 25
Two-Case complete for kerosene	14 00	" " " " two burners each two inches wide	3 00
" " complete for alcohol	14 00	" " " " " " " " " " " "	1 50
Three-Case Vulcanizer—complete for gas	16 00	Vulcan Gas Stove	
" " " " " " " " " " " "	16 00	NOTE.—We make no allowance where Vulcanizers with malleable iron flasks are ordered instead of brass ones.	
" " " " " " " " " " " "	1 00		
Two-Case Boiler, cover, thermometer, wrenches	\$10 50	Felt Wicks for Union Kerosene Stove, 4 in. per doz.	\$1 00
Three-Case " " " "	11 50	Endless Packing, for J & L's Vulcanizer, each	05
Three-Case Boiler, without cover and thermometer	6 00	" " " " " "	05
Three-Case " " " "	7 00	Ordinary " " " " " "	06
Thermometer-Case and Tube, complete	2 00	" " " " " "	06
Outside Thermometer-Case	50	" " " " " "	10
Inside " " " "	50	Alcohol Lamp, for Vulcanizer	60
Cover, with Thermometer-Case and Thermometer	7 00	Jackets	35
" " " " " "	6 00	Thermometers, each	25
" " " " " "	2 00	Base, for either alcohol or gas	25
New Ring to Boiler	2 00	Gas Burner for Vulcanizer	60
" " " " " "	2 00		
Bottom to Boiler	2 00		

HIGHLY IMPROVED MODELLING COMPOSITION

FOR

Taking Impressions of the Mouth, or any other Purpose
where a Perfect Impression is Required.




DIRECTIONS.—Softens the Composition in hot water, and when soft enough work into the desired shape with the fingers; place it in the cup, and then soften the surface with dry heat. This makes the surface softer than the main body. It takes a better impression, and hardens quicker. Should dry heat be used exclusively, wet the fingers occasionally to prevent the Composition from sticking. It is not necessary to oil the impression before pouring the plaster cast, as the Composition can be easily removed by immersing for a few minutes in hot water.

No. O.—EXTRA SOFT.—This grade is for restoring any of the other grades which have become hard by frequent use. They may be mixed in hot water.

No. 1.—SOFT.—This grade is for use in cold water and in tender mouths, and softens at a low heat; hardens in two minutes.

No. 2.—MEDIUM.—This grade is mostly used, and requires a higher heat to soften than No 1, and sets quicker.

No. 3.—For use in hot weather; requires a higher heat to soften than No. 2, and hardens quicker.

 **No. 2** will always be sent unless other numbers are specified.

Price per Pound, - \$1.25. Per Half Pound Box, - \$0.63.

KNOXVILLE DENTAL DEPOT,

NO. 11 ASYLUM STREET, KNOXVILLE, TENN.

Where may be found a complete Assortment of Dental Supplies. I keep all
Dental Goods and Instruments Made and Handled by

Johnson & Lund,

M. M. HARRIS, Proprietor.

JAMES M. EARNEST,

MANUFACTURER OF

Dentists' Files,

OF ALL DESCRIPTIONS.

NO. 2121 SARGEANT STREET, PHILADELPHIA.

Oct. 1888.

Birmingham, Ala., Dental Depot

2007 $\frac{1}{2}$ Second Ave.

T. M. ALLEN, D. D. S., Proprietor.

Has constantly on hand a large stock of Johnson & Lund's Improved Artificial
Teeth, Extra Tough Rubber, Extra Amalgams, Onyx Cement, Lathes, Vulcanizers
Impression Cups, &c., &c.

N. B.—Special attention given to selecting teeth, when samples and models
are furnished.

CHAS. ABBEY & SONS,

DENTISTS' FINE GOLD FOIL,

Soft, or Non-Adhesive, and Adhesive.

ALL FROM ABSOLUTELY PURE GOLD.



230 Pear Street, Philadelphia.

January, 1889.

JOHNSON & LUND'S

Improved Dental Lathe, No. 1.



In the construction of this Lathe we have introduced several novelties which only need to be seen to be appreciated. In the first place, one end of the spindle is made with a split-chuck and collar, which admits of the mandrels being changed with great facility, and insures their running true. The other end of the spindle is made taper to carry brush

wheels, felt wheels, &c. In the next place, the table, which is made of solid walnut and fitted with two drawers, extends about $1\frac{1}{2}$ inches further in the rear of the head than it does in front of it,—thus furnishing the dentist or operator with a sufficiency of table room upon which to lay articles that it is desirable to have at hand. The driving-wheel is fifteen inches in diameter, and weighs 24 pounds. This great weight and enlarged diameter, in combination with the small size of the pulley, assures its running with great ease, power and rapidity.

The column of the Lathe, being hollow, permits of the Lathe rising and falling over six inches,—thus allowing the cord to be tightened without taking it off. Accompanying the Lathe will be found three mandrels, fitted with screws and brass shoulders, one for each size of the threads fitted in Johnson & Lund's Improved Metallic Centre Corundum Wheels. There are also three brass chucks which screw on to one of the mandrels, for using with corundum wheels made without metal centres.

The Lathe is neatly painted and gilded, and is so beautifully modeled that it is quite an addition to the operating room, when it is desirable to use it in such a position. The Lathe is so constructed that it can be taken apart and packed in a very small compass. The spindle is fitted with an appliance to take up any lost motion.

For cuts of chucks and mandrels belonging to this Lathe see page 28 of adv. and note at foot of same page.

—o—

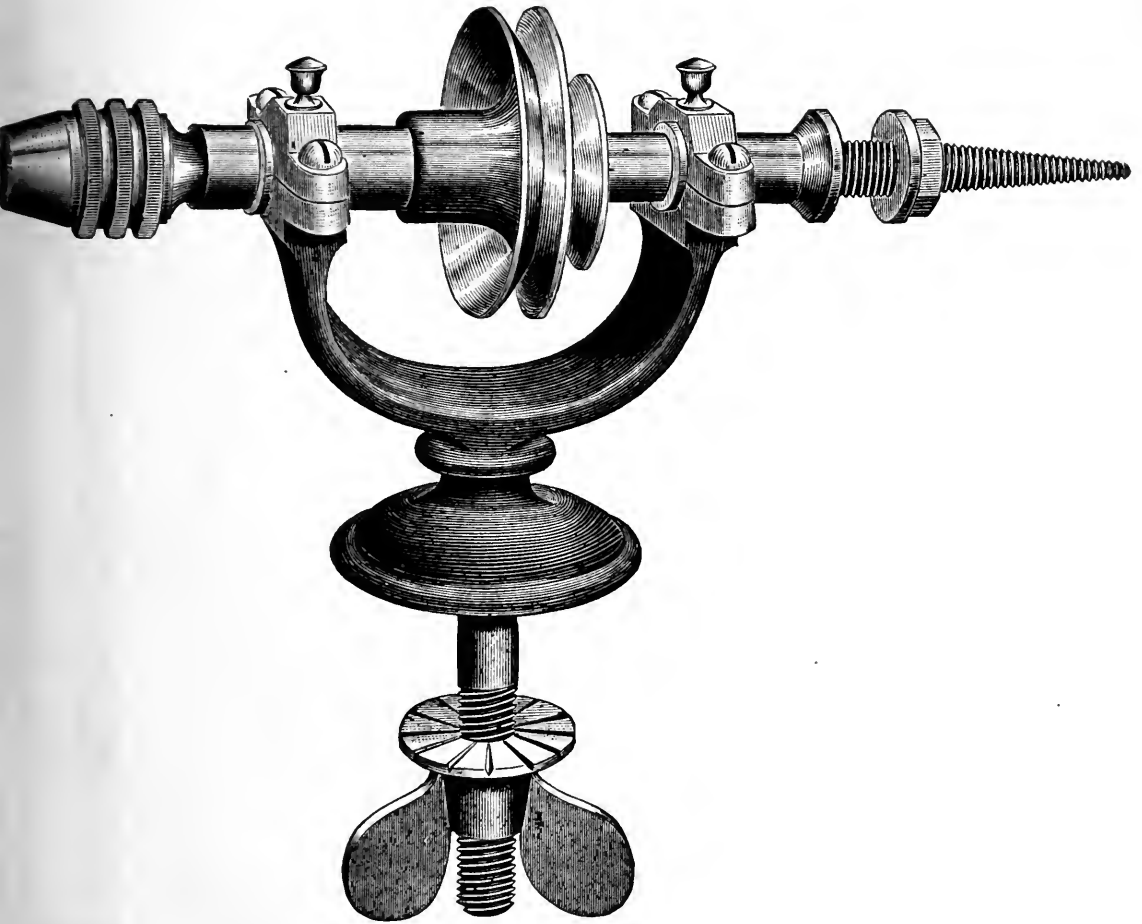
Price, Complete, with Mandrels and Chucks boxed, \$17.00.

JOHNSON & LUND,

Principal Depot and Manufactory,
620 Race Street,
Philadelphia.

Branch Depot, 514 Wabash
Avenue, Chicago.

LATHE HEAD, No. 4.

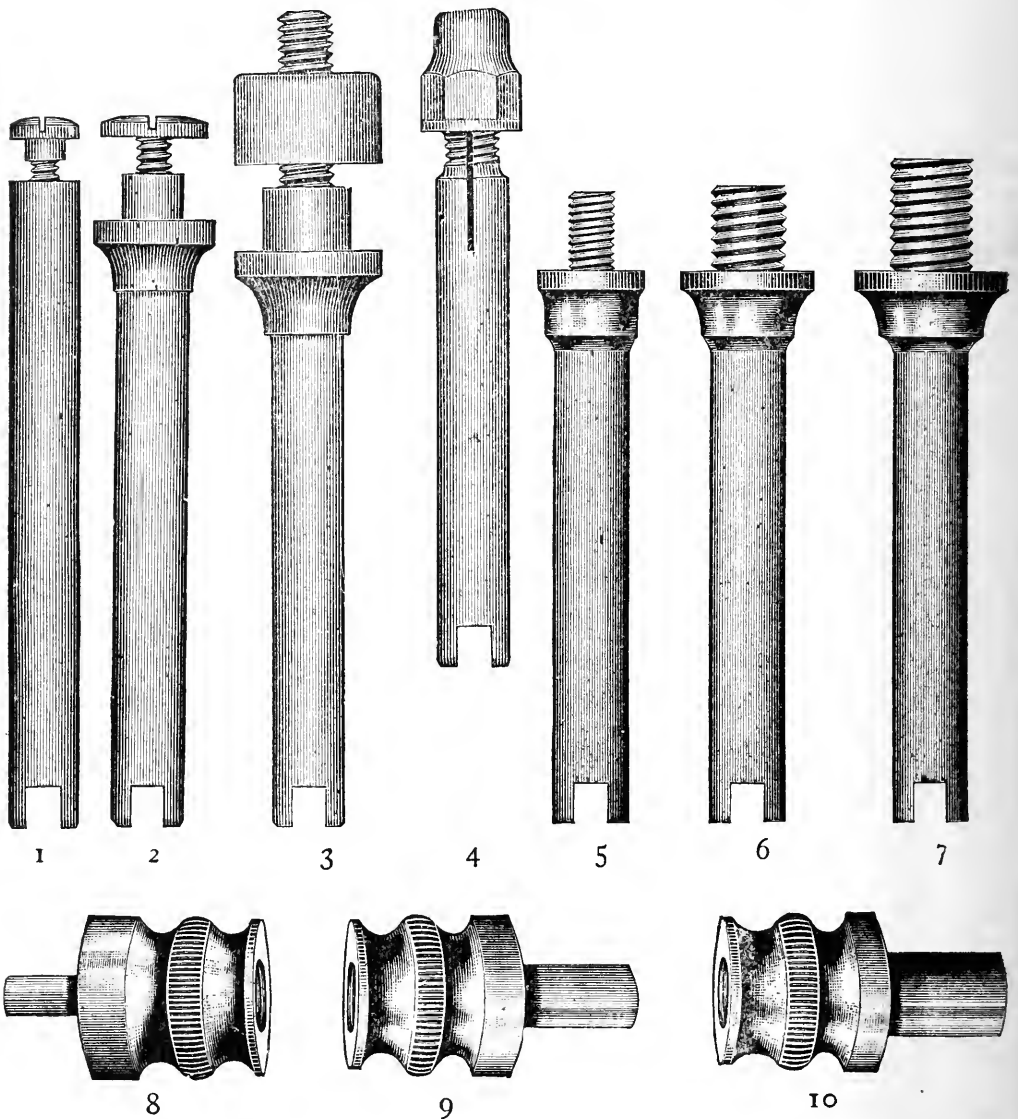


This Lathe Head, in connection with the Lawrence Driving Wheel makes the most complete and satisfactory Dentists' Lathe in the market. It is the best article of the kind ever offered. The workmanship and materials used are of the very best quality. The bearings are accurately fitted, and so arranged that any lost motion which may occur by wear can be taken up with rapidity and accuracy. It is finished with a cone-screw on one end and a split-chuck upon the other. The chuck is made with a cross-pin at the rear end, which is grasped by the split ends of the mandrels, thus giving them very long bearings. The oil-holes are covered with handsome metal screw-caps. The spindle and pulley-wheel are highly finished, and the frame-work Japanned. Ten chucks and mandrels are supplied with the lathe, if desired. For cuts of chucks and mandrels see page of advertisements and note at foot of page 28.

PRICE.

Head complete, with ten chucks	\$11.00
Head, without chucks	8.00

Chucks and Mandrels for Lathe-Head No. 4, and Johnson & Lund's Improved Lathe, No. 2.



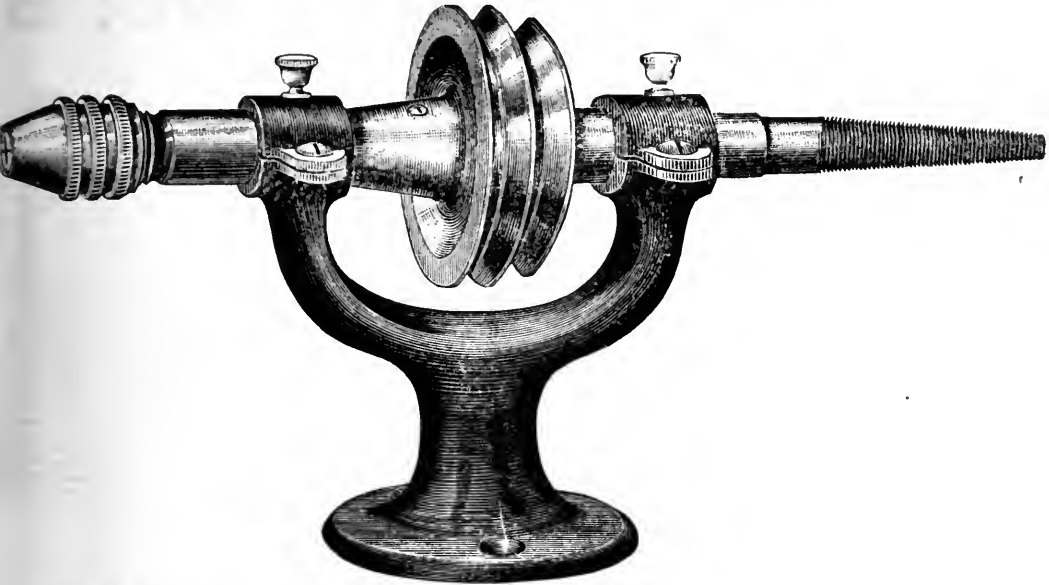
Nos. 1, 2 and 3 are screw chucks for corundum wheels, &c. No. 4 will carry engine burs, drills and tools. Nos. 5, 6 and 7 are screw mandrels for the improved metal-centre corundum wheels. Nos. 8, 9 and 10 are brass chucks fitting upon No. 7, and are intended for shellacing corundum wheels on.

PRICE.

Set of ten Chucks,	.	.	.	.	.	\$3.50
No. 1,	.	.	\$.30	No. 5,	.	35
No. 2,	.	.	45	No. 6,	.	40
No. 3,	.	.	60	No. 7,	.	45
No. 4,	.	.	1.00	No. 8, 9, 10, each,	.	25

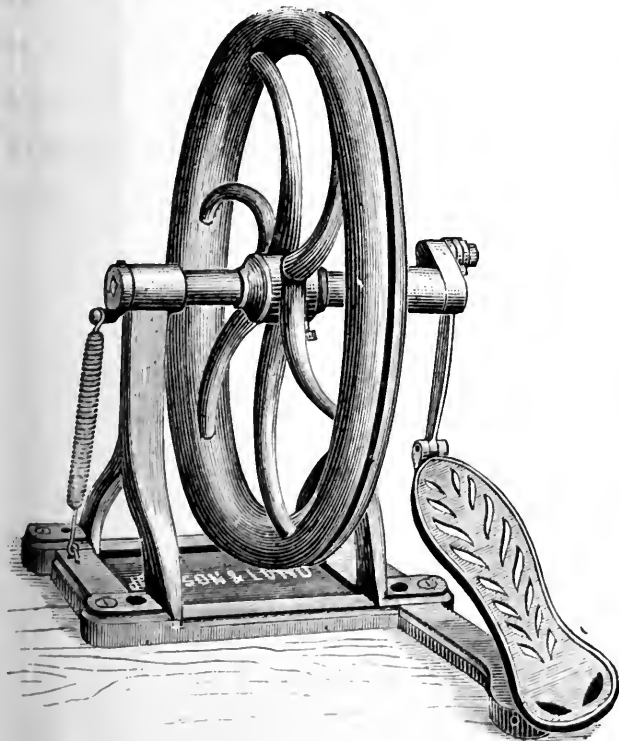
NOTE.—A set of Chucks to accompany Improved Lathe No. 1. Lathe Head No. 1 and Socket Lathe Head consists of Nos. 5, 6, 7, 8, 9, 10. Illustrated above.

LATHE HEAD, No. 1.



This Lathe Head is furnished with a split-chuck and collar, which allow the mandrels to be changed with great facility, and insures their moving true; the other end of the spindle is made taper to carry brush wheels, felt wheels, &c. Accompanying the Head will be found three mandrels fitted with screws and brass shoulders, one for each size of the threads, fitted in Johnson & Lund's Improved Metallic Centre Corundum Wheels. There are also three brass chucks, which screw on to one of the mandrels, for using corundum wheels made without metal centre. For the cuts of the mandrels and chucks belonging to this Lathe Head see p. 28 of adv. and note at bottom of same page. PRICE COMPLETE, WITH MANDRELS AND CHUCKS, \$6.00.

The Lawrence Driving-Wheel.

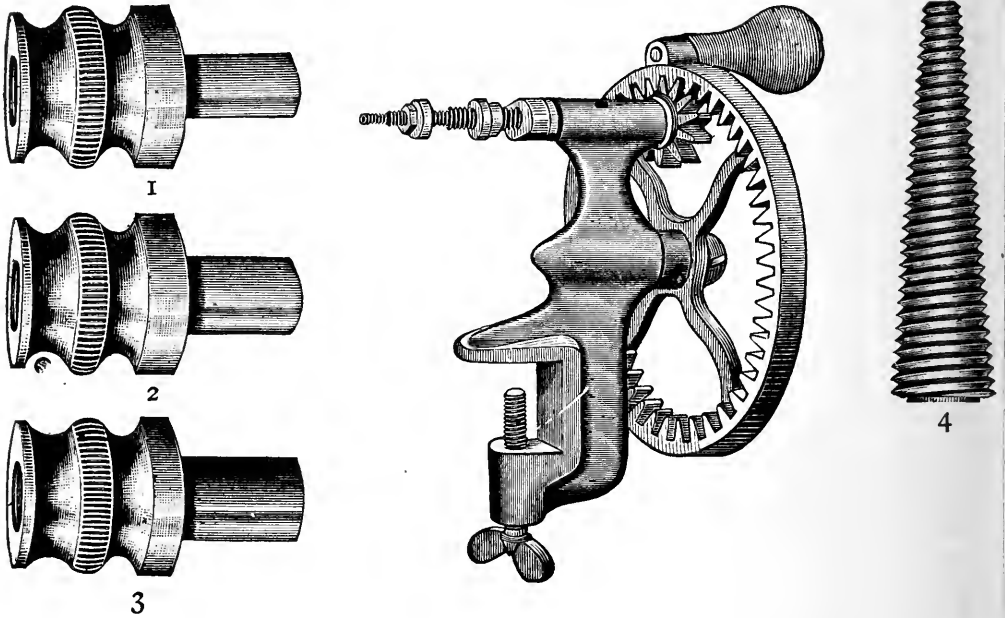


This is by far the most serviceable foot-power ever offered for general use to the profession. The Wheel measures $18\frac{1}{2}$ inches in diameter, and weighs 45 pounds. The entire apparatus is handsomely painted, and each wheel is furnished with a spring for the purpose of keeping the wheel, when at rest, off the centre and ready for action.

The cut is a faithful representation of the article itself.

Driving-Wheel . . .	\$11.00
Cord and Coupling . .	.50

HAND LATHE No. 5.



The above cut represents a portable Hand Lathe for dental purposes. It is well made and weighs only 2 pounds, making it valuable for a traveling outfit. The Lathe is furnished at its shoulder with parting nuts for holding large wheels, and the mandrels are furnished with three different sized threads, which will accommodate any size of the metal centre—can be used with the brass chucks furnished with the Lathe. We also furnish a cone screw for brush felt wheels, etc.

PRICE.

No. 5 Hand Lathe and Chucks	\$3.00
Extra Chucks, each . . . . .	.25

Johnson & Lund,

620 RACE ST., PHILADA.

514 WABASH AVE., CHICAGO.

Jacksonville, Florida, Dental Depot, No. 19 East Bay Street.

A. P. FRIES & CO., PROPRIETORS.

Dealers in JOHNSON & LUND'S Improved Teeth, Extra Tough Rubber, Crimson Brown Rubber, Jet Black Rubber, Light and Dark Red Rubber, Extra Amalgam, Onyx Cement, Johnson & Lund's Lathes, Vulcanizer, Impression Cups, and a full line of Dental Goods generally.

Before purchasing elsewhere give them a call.



January, '88.

M. H. SPENCER & CO.,

195 AND 197 W. SEVENTH STREET

CINCINNATI OHIO.

DEALERS IN

Artificial Teeth and all Varieties of Dental Goods.

DR. CHUPEIN'S COPPER AMALGAM.

Copper amalgam is one of the best preservatives of the teeth except Gutta Percha. Its only drawback being its inability to hold its color in the mouth. As far as has been observed it neither contracts nor expands, but absolutely fills the cavity. It has considerable edge strength. While it turns to almost an inky blackness, it does not discolor the tooth bone. It sets very slowly, especially when used without squeezing the excess of mercury out of it, and it does not, on this account, seem to be applicable for contour work. It is applicable for back teeth in either jaw, and on distal surfaces; and particularly for **desperate cases**. While dryness of the cavity is always recommended, in cases where this condition is impracticable, it may be used with beneficial effect. It is the most economical amalgam, for the pieces left over may be re-heated, ground up and used until all is consumed. If on re-heating the pieces left over, it is found that they are crumbly or work too dry, it will only be necessary to add a very small globule of mercury to restore it to its plastic condition. Although composed only of copper and mercury, it does not seem to leave any metallic or coppery taste in the mouth. It does not appear to be so good a conductor of heat or cold, as either tin, gold, or the ordinary amalgams, and on this account may be used in cavities where the nerve is nearly exposed. Although this is not recommended, it being better in such cases to interpose a non conducting material under all metallic fillings—still it may be done with success.

Full directions accompany each package.

PRICES.

One-half ounce package,	.	.	.	.	.	.	each, \$.75
One " "	.	.	.	.	.	.	" 1.50

TAKE NOTICE!

NEW CATALOGUE.

We will issue our New ILLUSTRATED DENTAL CATALOGUE this month and will mail a copy to any Dentist or Dealer sending us 15 cents, to pay postage.

JOHNSON & LUND,

620 Race Street, Philadelphia.

514 Wabash Avenue, Chicago.

This book must be returned to
the Dental Library by the last
date stamped below. It may
be renewed if there is no
reservation for it.

HRA:

Dental office and laboratory guide 1-2(1887-88).

Harry R. Abbott
Memorial Library

1-2(1887-88)

DO NOT
REMOVE
THE
CARD
FROM
THIS
POCKET

FACULTY OF DENTISTRY
TORONTO

